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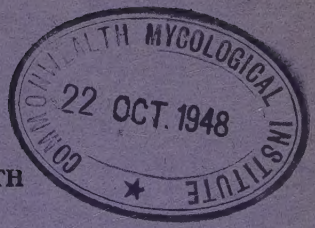

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THE

VETERINARY BULLETIN

Vol. 18.] September, 1948. [No. 9.

DISEASES CAUSED BY BACTERIA AND FUNGI

TAGER, M., & HALES, H. B. (1947.) **Quantitative coagulase and toxin production by staphylococci in relation to the clinical source of the organisms.**—*Yale J. Biol. Med.* **20.** 41–49. [Author's summary copied *verbatim.*] **1550**

The quantitative production of coagulase and of toxins has been studied in an attempt to determine the correlation of these properties with the clinical origin of the staphylococci. Of 242 strains, 66 per cent produced slight amounts of coagulase while 8·7 per cent yielded high titers. More strains derived from the nose, throat, ears, eyes, skin, and vagina had higher coagulase titers than did strains isolated from lesions, and this difference was statistically significant.

No significant differences were found in the quantity of rabbit cell lysin and sheep and human cell lysins among strains derived from different clinical sources. There was no correlation between the quantity of coagulase and of rabbit cell lysin production. The possible clinical implications of the findings are considered.

*BUTAYE, R. (1945.) Drie menschelijke Streptococcenstammen bij Dieren aangetroffen. **[Occurrence of three human strains of streptococci in animals.** —*Vlaam. Diergeneesk. Tijdschr.* **14.** 19–22. English, French and German summaries. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **88.** 109.] **1551**

B. refers to the identification of three human streptococcus strains isolated from animals. One strain was isolated from the milk of a cow with udder infection; a second was found in the udder secretion of a bitch with metritis, both being identified as streptococcus Group C; a third strain, isolated from puppies with impetigo, was identified as streptococcus Group A; the infection was apparently incurred through contact with a girl affected with chronic angina.—K. J. SINCLAIR.

BREUS, A. A. (1944.) O mytnom antiviruse i vaktsine. **[Strangles culture filtrate and vaccine.]**—*Veterinariya, Moscow.* No. 8–9. pp. 6–10. **1552**

Strangles culture filtrate and vaccine, although possessing antigenic properties, do not possess immunizing properties as shown by tests on large numbers of horses and foals. These preparations, when injected subcutaneously or intravenously may often prolong the course of the disease, cause shock reactions, and the formation of abscesses at the site of inoculation.—I. W. JENNINGS.

WHITE, P. B. (1946.) **Note on a variant of *B. anthracis* which fails to form heat-resisting endospores, and on attempts to immunize guinea-pigs against anthrax infection with killed vaccines prepared from it.**—*Brit. J. exp. Path.* **27.** 356–362. **1553**

Variant races of the "Vollum" strain of *B. anthracis* were isolated from platings which had been exposed to complement activated anti-anthrax serum. The variant races formed different types of colony from the original and did not form spores more resistant to heat or markedly more tenacious of life than the vegetation rods, though there was a process of abortive sporulation of the variant.

The virulence of the strain decreased with repeated subculture. Inoculation of g. pigs with heat or alcohol killed agar cultures produced a relatively slight degree of immunity. When the organism was grown in g. pig blood with the addition of meat extract, inoculation with a toluene killed culture produced a more substantial immunity in g. pigs.—R. SCARISBRICK.

GLADSTONE, G. P. (1946.) **Immunity to anthrax: protective antigen present in cell-free culture filtrates.**—*Brit. J. exp. Path.* **27.** 394–418. **1554**

Anthrax oedema fluid protects rabbits against lethal doses of *B. anthracis* spores. Such fluid contains a removable toxic factor, an immunizing factor and two polysaccharides, a and b, both free and combined with protein. The active factor is probably a combination of polysaccharide a and protein.

The paper is devoted to work on the production of a factor similar to or identical with the

protective oedema filtrate factor from *B. anthracis* under *in vitro* conditions, and a study of its properties. An active substance (PCF) is produced by the growth of *B. anthracis* in rabbit serum or plasma and is itself destroyed by growth of the culture: little is formed at 12 hours and by 48 hours it has been mainly destroyed: 18 hours is optimal. The size of inoculum and pH of the medium are also important; no PCF is produced at pH 6·5 or less. It was found that the plasma and serum of other animals could also be used; sheep plasma was thereafter mainly used.

A minimum of two weekly injections of PCF was necessary for the protection of rabbits: three doses were normally used. The immunity derived is substantial, protected rabbits surviving 100,000 A.L.D. The route of inoculation was unimportant for the development of immunity. Immunity could also be established in sheep and monkeys but no protection was conferred on mice of g. pigs. Experiments with different strains of *B. anthracis* showed that the production of PCF is not related to virulence, capsulation, or sporulation: no virulent strain failed to produce PCF and the production of PCF by avirulent strains was related to their efficacy as living vaccines. *B. cereus* produced no PCF.

No toxic inflammatory factor, such as is present in oedema fluid, was found. PCF is stable and was still active after storage for 180 days at pH 7·12 at room temperature but on either side of this pH activity was lost fairly rapidly. PCF factor was completely destroyed at 60°C. in 1½ hours.

Two factors are necessary in plasma for the production of PCF, one, dialysable, could be replaced by $NaHCO_3$, the other, not dialysable, probably associated with the serum proteins.

PCF confers no passive immunity on mice or rabbits. The sera of rabbits and sheep immunized with PCF produced no passive immunity in mice. There seems to be no indication of absorption or neutralization of immune serum (commercial anti-anthrax serum or immune serum produced as a result of PCF inoculation) by PCF. PCF produced no precipitation or complement fixation when tested against sera from animals either hyperimmunized with PCF, or with PCF and living organisms, when tested against sera containing high titres of antibody against the capsular polypeptide, or against sera containing high titres of antibody against a polysaccharide isolated from the organism.

It is concluded that the PCF factor has very similar properties to and is probably identical with the protective factor of anthrax oedema fluid.

—R. Scarisbrick.

Mikulaszek, E., & Ratomski, A. (1946.) Badania doświadczalne nad budową antygenową zmiennych form laseczki wąglika. [**The antigenic composition of dissociation forms of** *Bacillus anthracis*.]—*Med. Wet.* **2.** 140–146. [Abst. from English summary.] **1555**

Four cell fractions were obtained from dissociation forms of *Bacillus anthracis*, the first having the structure of a protein linked with a carbohydrate, the second and third being free polysaccharides and the fourth having characteristics of a polypeptide. Complement fixation tests on these fractions as antigens yielded negative results, while precipitation tests were positive with all four fractions. Polysaccharide haptens were obtained from anthrax spores but it proved impossible to obtain a polypeptide fraction. In tests made on the different cell fractions obtained from dissociation forms of the capsulated form, the mucoid and rough form, and a strain with attenuated virulence from the Pasteur vaccine, it was found that strongly active fractions were obtainable only from the capsulated form.

—J. H.

Plum, N. (1946.) Problemer ved tuberkulosebekaempelsen i Danmark. [**Problems of tuberculosis control in Denmark.**]—*Norsk VetTidsskr.* **58.** 505–522. **1556**

This is the text of a lecture which indicates in broad terms the results of the bovine TB. campaign in Denmark and discusses some current problems. TB. was not prevalent before about 1890, but spread quickly within the large herds of the mainland, so that in the early nineteen thirties some 75% of the cattle in Jutland were considered to be infected. The control measures are not here described in detail, but the figures for TB.-free herds are quoted for 1937–1946. There was a rather spectacular rise in clean herds from 26·5 to between 94% and 100% on the islands and 90% in Jutland.

TB. in horses, pigs, sheep, goats, dogs, cats and poultry is discussed with reference to the main problem of bovine infection. In pigs the existence of corynebacterium infection is a great nuisance as it complicates matters. Seventeen instances of transmission of bovine type TB. to cattle by infected persons have been observed and confirmed in Denmark. Cases of human TB. have been carefully studied and by 1940 3,698 cases had been investigated with the result that 5·35% were shown to be of bovine type. In one sanatorium 40% of 165 country dwellers with pulmonary TB. had this type (cf. 3·6% of 362 town dwellers). Some hundreds of farm inhabitants including children were examined for TB. and a direct connexion was established between such infections and the presence of tuberculous cattle, the percentages of infected persons on infected farms at

the ages of 15, 35 and over 35 being 70%, 90% and 100% respectively as compared with 10%, 60% and 90% on farms where the cattle were TB.-free.—J. E.

I. BROWN, T. G. (1947.) **A survey of tuberculosis in the industrial county of Lanarkshire, Scotland.**—*J. Hyg., Camb.* **45.** 232–238. **1557**

II. BROWN, T. G. (1947.) **The influence of social factors on the incidence of extrapulmonary tuberculous infection. An investigation of the environment of tuberculous patients in Lanarkshire, Scotland.**—*Ibid.* **45.** 239–250. **1558**

Of the total population of Lanarkshire of 504,196 persons, 443,772 reside in the industrial area of 135,187 acres and 62,424 live in the rural area comprising 400,888 acres. The incidence of disease in the industrial and rural areas can thus well be compared. The paper deals largely with the comparative incidence of the human and bovine types of tubercle bacillus as they affect the population. No attempt was made to classify the patients suffering from pulmonary tuberculosis from whom specimens were obtained, but the figures are of interest in showing a percentage of bovine infection of 2·5% out of the 80 cases dealt with. This approximates closely to the findings of Griffith who in Scotland in 1930 found a percentage of 1·4 of bovine infection in such cases.

There was a higher incidence of human infection in the bone and joint cases than had been found by other workers in Scotland and thus, some other factor or factors must have operated in Lanarkshire to alter the soil or increase the hazard on infection by the human type. [The author does not, however, appear to consider whether the lower incidence of bovine infection might possibly be due to the work of the County and Ministry veterinary staffs in this locality.]

The incidence of human and bovine types of organism are analysed at different ages and under different conditions. Out of 165 cases of tuberculous meningitis, 28·5% were due to bovine infection, rather a higher figure than the 22% given by Blacklock and Griffen in the Glasgow area. The cervical adenitis group gave a bovine infection of only 30·4%, a figure much lower than anything previously published in Scotland.

The author concludes by saying that his figures only serve to substantiate observations of regional variations and endorse the findings of other workers who have found a lower proportion of bovine infection in industrial districts. As Lanarkshire is the most industrialized county in Scotland it was to be expected that the results of this investigation might have given an even greater predominance of human infection than actually was found.

II. The incidence of human and bovine types of tuberculous infection in Lanarkshire in persons housed in substandard conditions is discussed. During the investigations living tubercle bacilli were found in bulk milk from two of the three pasteurizing establishments supplying milk to the industrial area. A table is given showing the number and percentage of bulk milk samples found to contain living tubercle bacilli between the years 1937 to 1942. These varied between 4 and 7%, with the exception of the year 1939 when 69 positive samples were found out of 648 examined or 10·7%. This was overwhelming and convincing evidence that milk was possibly the source of infection in patients from whom bovine strains of tubercle bacilli were isolated.

Poor housing conditions and the history of contact with open cases of pulmonary tuberculosis were the most important factors in infections with the human type and poverty and the milk supply in infections with the bovine type of tubercle bacilli.—D. S. RABAGLIATI.

CUMMINS, S. L. (1946.) **Empire and Colonial tuberculosis. A general survey.** pp. 60. London: National Association for the Prevention of Tuberculosis. 5s. **1559**

Tuberculosis in people living in isolated communities and tribes differs in many respects from the form seen in people living in the large centres of population. These differences in the nature of the lesions, clinical severity and reaction to tuberculin are considered to be due more to lack of immunity than to adverse conditions of hygiene, housing and nutrition.—M. C.

MONTEIRO, E. (1945.) Nota sobre tuberculinas. **[Methods for preparation of tuberculin.]**—*Mem. Inst. Osw. Cruz.* **42.** 1–10. [English summary.] **1560**

Tuberculins for human use are prepared at the Institute of Oswaldo Cruz by growing human or bovine types of bacilli in a slightly modified Dorset's synthetic medium. The products are standardized by comparison with a standard tuberculin in Von Pirquet's reaction on a group of 15–20 adults, chosen indiscriminately. In general M. used only the human type. He also used a mixture which contained one-third of the volume of the bovine type.—I. W. JENNINGS.

KROPP, G. V., & FLOYD, C. (1947.) **Studies of a carbohydrate-lipoid complex from the human strain tubercle bacillus H37.**—*Yale J. Biol. Med.* **20.** 27–40. [Authors' summary copied *verbatim.*] **1561**

A lipo-polysaccharide fraction of the tubercle bacillus has been found to have some therapeutic

value in the treatment of pulmonary tuberculosis. The clinical results are more suggestive because of the severity of the type of case treated. The possibilities of this line of treatment justify further investigation.

ROSSELL, C. S. C. (1947.) Cultura cromogênica de um bacilo ácido-álcool resistente, isolado de mosquito (Culicíno) capturado sôbre leproso em plena natureza, com rétrocultura obtida de rato branco. **[Isolation of an acid-alcohol fast bacillus from a mosquito captured in a leper colony.]**—*Mem. Inst. Osw. Cruz.* **44.** 413–424. **1562**

A chromogenic, eugonic culture of an acid-alcohol-acetone fast bacillus was isolated from a culicine mosquito, captured after feeding on a leprous patient.

The pigment varied from golden yellow to orange on Lowenstein's medium. The organism formed an abscess in the local lymph node when injected subcutaneously in the axilla of a white mouse. The organism was not identified.

—I. W. JENNINGS.

OLSON, Å. (1945.) Bidrag till kännedomen om listerella- och streptokockinfektionernas förekomst i efterbörder och foster. [*Listeria* (*Erysipelothrix*) **and streptococcal infection of the placenta and foetus, in cattle and sheep.**] —*Skand. VetTidskr.* **35.** 273–280. [English summary.] **1563**

Erysipelothrix monocytogenes was isolated from the placenta and foetal abomasum content, after abortion in cattle and sheep. *Corynebact. pyogenes* was also recorded. *Erysipelothrix monocytogenes* is considered to be an unusual causative agent of abortion in Sweden, streptococcal infection being more frequent. The streptococcal species recorded were *S. schütz* and *schütz* variants, *S. equi* and *S. lanceolatus*.—F. E. W.

RAŠIN, K. (1947.) Tularemie v Československu. **[Tularaemia in Czechoslovakia.]**—*Čas. československ. Vet.* **2.** 5–10. **1564**

Repeated occurrence of tularaemia in hares, wild rabbits and perhaps other rodents in some districts leads to the conclusion that these animals are a reservoir of infection for other animals and man. Emphasis is laid on sanitary control of game and wild rodents in infected areas.—E. P.

DI MAGGIO, C. (1946.) Influenza di alcuni joni sulla riproduzione, semovenza, cromogenesi ed attivita' fermentativa del " B. pyocyaneus ". **[Influence of some ions on reproduction, mobility, chromogenesis and fermentation of sugars in** *Pseudomonas pyocyanea*.**]**—*G. Batt. Immun.* **35.** 279–290. [Abst. from English, French and German summaries.] **1565**

Pseudomonas pyocyanea was cultured in synthetic media deficient in the ions Na, Mg, Ca and K, and its biological properties investigated. The organism was able to multiply and to develop the properties of motility, pigment formation and sugar fermentation in the absence of Na, Mg and Ca ions. Pigmentation occurred on synthetic substances containing glucose or mannose as the sole source of carbon, but not when these sugars were replaced by lactose, sucrose or maltose. Chromogenesis was partially inhibited by peptone.

—K. J. SINCLAIR.

DU BUY, H., ARNOLD, F. A., & OLSON, B. J. (1947.) **Studies on the air transmission of micro-organisms derived from the respiratory tract. 1.** *Lactobacillus acidophilus* **as a test organism.**—*Publ. Hlth Rep., Wash.* **62.** 1391–1413. [Authors' summary copied *verbatim*.]**1566**

A series of experiments is reported on the use of *L. acidophilus* as a test organism in studies on air-borne bacteria.

The results indicate that *Lactobacilli* from the upper respiratory tract do not become directly suspended in measurable quantity in the air surrounding an individual while he is speaking, coughing, or sneezing. An aspirator type atomizer was used to suspend *Lactobacilli* in the air. A considerable number of organisms subjected to atomization were retained in the atomizer under conditions of these experiments. The results of the atomization experiments show that a reliable value for the number of organisms expelled from a liquid bacterial suspension into the air can be obtained by atomization of a aliquot portion of the suspension into samplers directly connected to the atomizer. The media in which bacteria are suspended were found to influence atomization. A mucin suspension was found to be the most difficult medium used in these experiments from which bacteria could be suspended in the air. *Lactobacilli* which become suspended in the air from a liquid medium, either by natural or artificial means, settle out of the air at a very rapid rate.

TSION, R. A. (1945.) Enterokolity molodnyaka zhivotnyhh. **[Diarrhoea in young stock.]**—*Veterinariya, Moscow.* No. 1. pp. 9–16. **1567**

The grouping together of various types of scours under one heading, " colibacillosis ", frequently leads to confusion. T. distinguishes those groups in which *Bacterium coli*, var. *communius* or its variants play a primary or secondary part :– subacute scours with localized slowly developing infection and functional disorder of the digestive tract and blood system, causing either death or stunting ; chronic scours with gradual failing of the digestive functions leading to death by emaciation ; and acute colibacillary sepsis—

with no intestinal symptoms, and usually ending in death.

Sub-acute and chronic scours are essentially due to incorrect feeding or change of diet. In early subacute cases there is serious inflammation of the intestines with hyperemia of the mucous membranes and little mucous on their surface. In protracted cases there is abundant thick turbid mucous. The lymph nodes are slightly enlarged; the blood is pale and coagulates poorly. In chronic cases the picture varies, but the main features are enlargement of the lymph nodes, thickening of the intestine walls and pallor of the mucous membranes.

Bacteria of the paracolon group are important causal organisms in the cases spoken of as "coli-bacillosis." Conditions of feeding are only of secondary importance. The onset of the disease is sudden. The typical culture from any organ shows an abundant growth of the variants of the coli-paracolon group.

In all organs and mucous membranes, particularly on the coronary vessels of the heart, small haemorrhages are present. The lymph nodes are swollen and haemorrhages are present. The gall bladder usually contains only a small quantity of bile or is empty. The liver is hyperaemic; the spleen is enlarged. Calves should be separated into small groups to reduce contacts with animals in the incubation stage (1–4 days). Sick animals should be isolated.

Twenty-one strains of *Bact. coli* and its variants have been obtained. Vaccines of all 21 types were prepared from agar culture. Sheep were inoculated with these by the usual methods. A table shows the results obtained on three sheep farms. 4,263 animals were inoculated with locally prepared vaccines, and only six died after inoculation. In 1943 more than 20,000 animals were inoculated with excellent results.—S. W. SALTER.

MACCOLINI, R. (1941.) L'importanza patogenetica ed epidemiologica delle diverse specie e varietà di batteri del gruppo delle salmonelle. **[The pathogenic and epidemiological significance of the different species and strains of bacteria of the salmonella group.]**—*G. Batt. Immun.* **27.** 399–463. **1568**

This is a review of the literature on the pathogenesis and epidemiology of the salmonella infections of man, with references to the infections in animals and birds, and the association of fish with salmonellosis. The emphasis is mainly on what M. terms "sarcotoxinfections". Salmonella food poisoning is uncommon in Italy, due to the fact that meat products and duck eggs are seldom eaten raw or lightly cooked.

M. classifies the salmonella infections as:–
(a) primary specific, which include the paratyphoids of man and animals, the fowl and murine infections, and abortion in the mare, ewe and cow; (b) primary non-specific, including calf diarrhoea, bovine enteritis, certain forms of gastro-enteritis in man and summer diarrhoea in children; and (c) secondary salmonellosis, including the complications of swine fever and psittacosis, and sporadic secondary infections with *S. enteritidis* and others.—I. W. JENNINGS.

SAKAVARELIDZE, V. Z., & AMIRKHANOV, G. I. (1937.) Etiologicheskaya rol' korov-kormilits v zabolevanii telyat paratifom. **[Role of infected lactating cows in the dissemination of calf parathyroid. [Salmonellosis.]**—*Trud. vsezoyuz. inst. eksp. Vet.* **14.** 89–92. [French summary.] **1569**

The authors supported Miessner's contention that infected lactating cows can spread salmonella infection. The excretion of causative bacteria takes place in the faeces and milk. Infection can be controlled by the isolation and elimination of infected cows.—O. UVAROV.

KACHANOV, G. A., & EDEL'SHTEĬN, I. A. (1937.) Kartina krovi pri immunizatsii telyat protiv paratifa formol-vaktsinoĭ. **[Blood picture of calves immunized against paratyphoid (Salmonellosis) with formol vaccine.]**—*Trud. vsezoyuz. Inst. eksp. Vet.* **14.** 79–88. [French summary.] **1570**

The blood picture of calves was studied following immunization by two injections of formol vaccine.

Following the first injection there was leucocytosis and an increase in the number of erythrocytes accompanied with poikilocytosis.

After the second injection the leucocytosis increased.

Vaccinated calves which were artificially infected with *S. enteritidis* had a transient leucocytosis. Of two non-vaccinated controls which were artificially infected one which recovered had a very marked leucocytosis while one which died had leucopenia.—O. UVAROV.

EDWARDS, P. R., & BRUNER, D. W. (1946.) **The effect of form variation on the antigenic behavior of** *S. pullorum*.—*Proc. 50th ann. Meet. U.S. Live Stk sanit. Ass., 1946.* pp. 130–135. **1571**

GWATKIN, R. (1946.) **Discussion.**—*Ibid., 1946.* pp. 136–138. **1572**

The literature on variation of O-antigens in organisms of the salmonella group is reviewed, in particular Younie's observation of *S. pullorum* strains obtained from infected chickens which produced agglutinins different from those of the standard antigen strains [*V. B.* **16.** 215]. The

authors conclude on the basis of their own numerous agglutination and absorption experiments that the antigenic formula of *S. pullorum* is (IX, XII_1 [XII_2], XII_3), but that it is subject to variation with regard to antigen XII_2; usually strains contain individuals with a large amount and others with a negligible amount of XII_2, but cultures may become stabilized in either form thus giving rise to "standard" or "variant" strains. The question of preparing antisera suitable for agglutination of both forms is discussed.

The importance is stressed of using antigens with which one can detect birds infected with either type of *S. pullorum*, standard or variant. G. agrees with the authors of the preceding paper, in that by the use of an antigen lacking in XII_2 one will detect only birds infected with the standard type and, removing these only, a reservoir of the variant type of infection is built up. Figures of the incidence of the variant type of *S. pullorum* in several areas are given which show that since the use of both standard and variant antigens, the incidence of the variant type has decreased considerably. Some of the difficulties of preparing an antigen suitable to detect either type of *S. pullorum* infection are reported.

—A. MAYR-HARTING.

NICOL, G. (1947.) **The control of pullorum disease.**—*Aust. vet. J.* **23.** 294–300. **1573**

N. sets out details of the Victorian Government Pullorum Accreditation Scheme and gives results of the three years' testing since its inception. Reactors averaged about 5%. The whole-blood stained antigen test applied by government testers (lay and professional) and also the tube agglutination test are employed although more testing is now being done by the former method. Flocks are tested only once a year and may be accredited if less than 10% reactors are found. Some of the problems, such as a large number of doubtful reactions and an increase in reactors from one year to the next, are discussed. As would be expected there appear to be very few pullorum-free flocks.—L. HART.

HAYES, W. (1947.) **The behaviour of** *Salmonella typhi* **in the agglutination reaction.**—*J. Path. Bact.* **59.** 51–68. [Author's summary copied *verbatim*.] **1574**

The serum of normal rabbits agglutinates suspensions of *Salm. typhi* strain 901/0 and of freshly isolated strains after removal of Vi antigen to a markedly higher titre than similarly prepared suspensions of other salmonella types.

Both human and normal rabbit serum may show a high titre against suspensions of strain 901/0, but a much lower titre against the same suspension after boiling or treatment with 75 or 50 per cent. alcohol. This phenomenon is absent or apparent only to a slight degree in control experiments with high-titre immune O antiserum.

There is an absence of proportional relationship between the titres for untreated and boiled strain 901/0, since the agglutinability of boiled suspensions by normal rabbit sera remains fairly constant whereas that of untreated suspension varies widely.

Certain cultures of *Salm. typhi* strain Vi(1) and a partially rough strain of *Salm. enteritidis* have been shown, by rabbit inoculation, to stimulate the production of agglutinins against untreated but not against boiled strain 901/0.

Suspensions of freshly isolated strains of *Salm. typhi*, after removal of Vi antigen, showed little loss of agglutinability by normal rabbit serum after boiling, but against human serum some strains showed a fall comparable to that displayed by strain 901/0; others were stable to heat. It is probable that such heat-stable strains undergo a form of discontinuous variation towards heat lability and that this change is induced by artificial culture. Possible explanations of these phenomena are discussed in detail.

SCHEIDY, S. F. (1947.) **Lyophilized (desiccated)** *Brucella abortus* **vaccine (strain 19).**—*N. Amer. Vet.* **28.** 812–816. **1575**

There are disadvantages in the use of a fluid live brucella vaccine. After three months an insufficient number of viable organisms will be present to render the vaccine effective, and factors such as exposure to temperatures of 45°F. or higher and the subjection of the vaccine to shaking—*e.g.*, in transit, hasten this deterioration. To overcome these defects the vaccine was "freeze-dried". Saline was found to be unsuitable as a suspending agent and a mixture of phosphate buffer and skimmed milk is used. Because freeze-drying kills some of the organisms the suspension has to be double strength before freezing.

The vaccine is issued in the dry state along with a phial of sterile distilled water in which to suspend it. In the dry state it will keep for three years at refrigerator and room temperatures; and will withstand a temperature of 100°F. for six months and 122°F. for two days.

It is believed that the extra material and labour needed is justified by the stability and reliability of the dried product.—J. D. RANKIN.

DE BLASI, R. (1946.) Studio sierologico dell'antigene completo dei tre tipi di brucelle. [**Serological studies of whole antigens of the three brucella types.**]—*G. Batt. Immun.* **34.** 269–276. [English, French and German summaries: abst. from English summary.] **1576**

The author compared trichlor-acetic acid extracts of brucella, using precipitation, complement fixation and agglutinin adsorption with the glyco-lipoid inhibition reaction and concludes that the three types of brucella cannot be differentiated by these tests.—F. E. W.

OLSEN, Å. (1944.) Meddelande angående det statsunderstödda kastsjukebekämpandet. [**Report on State supported control of bovine brucellosis.**] *Skand. VetTidskr.* **34.** 125–126. **1577**

Swedish state supported bovine brucellosis control, inaugurated in 1938, was to continue after reorganization from January 1944 under the Department of Medicine assisted by the Agricultural Society with co-operation from practising veterinarians.

Compulsory slaughter was to be eliminated. The minimum interval of membership was to be two years, with a reduced rate for group membership and " attested-free " herd owners.—F. E. W.

ZAKHARINA, D. I. (1944.) Opyt immunizatsii antigenami B. perfringens, zaklyuchennymi v lanolin. [**Experimental immunization with *Clostridium welchii* antigens in lanolin.**]—*Zh. Mikrobiol., Moscow.* No. 9. pp. 21–23. **1578**

Ramon and Steinberg's method of immunization with antigens in lanolin was adapted to obtain serum with a high titre of antibodies when immunizing rabbits against *Cl. welchii.*

The initial two doses of 1 ml. of dry toxin, toxoid or culture, were mixed with 1 ml. of lanolin and 2 ml. of olive oil.—K. A. ALLEN.

JASMIN, A. M. (1947.) **Isolation of *Clostridium hemolyticum* from bones.**—*Amer. J. vet. Res.* **8.** 341–342. **1579**

Cl. haemolyticum was recovered from the bones of bovines two years after their death from bacillary haemoglobinuria. Attention is drawn to the need for proper disposal of carcasses in view of such material acting as potential reservoirs of infection.—D. L. HUGHES.

HARRIS, A. N. A. (1947.) ***Fusiformis necrophorus* infection of the liver in young lambs.**—*Aust. vet. J.* **23.** 152–153. **1580**

A note on the death of five lambs within a fortnight of birth. The lambs were born healthy, but sickened in a few days, developed diarrhoea and died. In one lamb examined P.M. there was focal necrosis of the liver and *F. necrophorus* was isolated from the lesion.

HART, L. (1947.) **Moniliasis in turkeys and fowls in New South Wales.**—*Aust. vet. J.* **23.** 191–192. **1581**

Three outbreaks of moniliasis in turkeys and chickens are described. Diagnosis was confirmed by examination of cultures.—D. F. STEWART.

PROBEY, T. F. (1947.) **Loss of virulence of *Treponema pallidum* during processing of dried blood serum.**—*Publ. Hlth Rep., Wash.* **62.** 1199–1202. [Part of author's summary and conclusions copied *verbatim.*] **1582**

Treponema pallidum suspended in saline-blood serum becomes avirulent and is apparently killed during the deep-freezing and drying process.

Rabbits inoculated with restored dried material failed to develop evidence of syphilitic infection during approximately 140 days' observation. Three successive subtransfers, observed for 13, 7, and 9 months, respectively, also remained negative.

The results obtained in this study not only confirm the results of Turner *et al*, but offer more conclusive evidence by reason of the longer observation periods and greater number of subtransfers.

LENTI, C., & ZAMBRUNO, D. (1946.) Respirazione, glicolisi e reproduzione di batteri agglutinati. [**Respiration glycolysis and reproduction of agglutinating bacteria.**]—*G. Batt. Immun.* **34.** 51–54. [English, French and German summaries, authors' summary slightly amended.] **1583**

Agglutination does not modify the respiratory and glycolytic activity of B. coli, B. paratyphi B, B. proteum x19 but it partially hinders their reproduction.

NIŽNÁNSKY, F., & KVAPIL, K. (1947.) Niekol'ko prípadov epizootickej lymfangitídy na Slovensku. [**Some cases of lymphangitis epizootica in Slovakia.**]—*Čas. československ. Vet.* **2.** 279–281. **1584**

Cryptococcus farcinimosus infection was introduced into Slovakia with horses of the fighting armies. From the end of the war until May, 1947, six cases were identified.—E. PŘIBYL.

See also absts. **1605** (swine erysipelas); **1617** (insect transmission); **1662** (mastitis); **1663** (leptospirosis); **1668** (swine erysipelas); **1716-1718** (technique); **1726-1730** (annual reports).

DISEASES CAUSED BY PROTOZOAN PARASITES

JACOBS, L. (1947.) **The elimination of viable bacteria from cultures of *Endamoeba histolytica* and the subsequent maintenance of such cultures.** — *Amer. J. Hyg.* **46.** 172–176. [Author's summary copied *verbatim.*] **1585**

Studies were made on the effect of penicillin on cultures of *Endamoeba histolytica* growing with *Clostridium perfringens*, an organism which is sensitive to the antibiotic.

It was found that *E. histolytica* trophozoites

would survive and possibly grow for 24 to 48 hours when transplanted into conditioned medium containing dead bacterial cells and penicillin. The growth of the live bacteria inoculated with the amebae was inhibited by the penicillin to a great extent, but not all the bacteria were killed. In the hope of eliminating viable bacteria, transplants were made into tubes of similar medium containing penicillin. In two instances success was achieved in maintaining *E. histolytica* in vitro after the elimination of *Cl. perfringens*. In one of these cases, the amebae were cultivated without viable bacteria for 3·5 months; in the second case, the cultures have survived for 2·5 months and are still being maintained.

The use of the penicillin technique is proposed as a method of investigating the effects of growth substances on *E. histolytica* in the absence of bacterially produced effects.

See also absts. **1674** (piroplasmosis); **1726-1728** (annual reports).

RIGDON, R. H. (1947.) **An in vitro study of the mechanism producing rapid diminution in the parasitemia in ducks infected with** *Plasmodium lophurae*. — *Amer. J. Hyg.* **46.** 254 – 259. [Author's summary copied *verbatim*.] **1586**

P. lophurae-infected blood when treated with carbon dioxide and injected into young ducks produces a less severe degree of parasitemia than similarly infected blood treated with either oxygen or nitrogen and injected into ducks. Apparently the plasmodia are killed by the carbon dioxide.

The physical and chemical factors in the blood during malaria infection should be investigated further to determine whether or not such factors may be important as immunological factors.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

RODRÍGUEZ, T. R., PRADO, L. M., & PALACIOS, H. R. (1945.) La prueba de fijacion del complemento en la investigacion de los virus aftosos. **[The complement-fixation test in the study of foot and mouth disease.]**—*Bol. Soc. paul. Med. vet.* **7.** 94–99. **1587**

The authors, in a preliminary report, describe the successful application of the complement fixation test to the study of F. & M. disease virus. Preparation of the antigen consists of grinding vesicle epithelium and suspending it in isotonic saline solution, centrifuging at 4,500 r.p.m. in an angle centrifuge, third-saturating the supernatant with ammonium sulphate to remove the smaller particles of tissue in the suspension, followed by precipitation of the antigen by half-saturation with ammonium sulphate. The precipitate is then redissolved and the sulphate removed by dialysis. The resulting preparation is finally made isotonic and 4% inactivated normal g. pig serum added. Type-specific sera, inactivated at 56°C., is obtained from convalescent g. pigs between the twentieth and thirtieth day after inoculation. If bovine serum is used it is inactivated for 20 minutes at 60°C. to eliminate non-specific effects.

The authors believe that the test will be of great importance in studying the antigenic structure of the virus and they quote the result of one experiment in which the sera from two groups of animals inoculated respectively with "virus complex I" and "virus complex II", both strains being predominantly type Vallée O, gave four times better fixation with the homologous antigen than with the heterologous antigen.—W. M. H.

STROZZI, P. (1944.) Pluralità del virus aftoso e suoi riflessi nella preparazione del vaccino. **[Plurality of foot and mouth disease virus and its importance in vaccine preparations.]**—*Clin. vet., Milano.* **67.** 53 –58. **1588**

A particular batch of bivalent F. & M. disease vaccine (Vallée O and A types) gave no protection against Vallée A type infection. Complement fixation studies of the virus strains showed that the original samples were of O and A types respectively. Virus of the fourth bovine passage of the A strain was used for the batch of vaccine in question and this material typed as an O. S. recommends the use of the complement fixation test as a rapid method of checking the type of strains used in vaccine production.

—W. M. HENDERSON.

REMLINGER, J., & BAILLY, J. (1946.) Sur la présence du virus rabique dans la salive des chiens sains. **[Rabies virus in the saliva of healthy dogs.]**—*Arch. Inst. Pasteur Algér.* **24.** 289–293. **1589**

It has been shown that certain blood-lapping bats of the family Desmodontidae can transmit rabies when apparently healthy and that the virus may be demonstrated in their salivary glands. Evidence of the persistence of the rabies virus in the salivary glands of dogs which had recovered from experimental infection with fixed virus, drew attention to the possibility that apparently healthy dogs might act as carriers of rabies. There is some evidence of human deaths from rabies contracted from apparently healthy dogs. Case histories are described, including one in which an apparently healthy dog transmitted the disease not only to a child but also to another dog which developed typical symptoms and transmitted the disease to a further dog before dying. There is some discussion of the theoretical mechanism of

the transmission of non-clinical rabies. It is concluded that the possibility of carriers causing infection is so remote as to be unimportant.

—S. BRIAN KENDALL.

I. PLUMMER, P. J. G. (1947.) **Preliminary note on Arctic dog disease and its relationship to rabies.**—*Canad. J. comp. Med.* **11.** 154–160. [French summary.] **1590**

II. PLUMMER, P. J. G. (1947.) **Further note on Arctic dog disease and its relationship to rabies.**—*Ibid.* **11.** 330–334. **1591**

I. In a study of one fox and three dogs which had died in the Baker Lake district, rabies was demonstrated in the fox and one of the dogs microscopically and confirmed by animal inoculation. The epidemiology indicates that wild animals are the reservoir from which dogs become infected. P. believes that rabies must at least form a part of the so-called Arctic dog disease. Baker Lake is situated some 400 miles north of Fort Churchill.

II. The presence of rabies has been established in Baker Lake, Aklavik and Frobisher Bay, areas representative of Eastern, Central and Western parts of the N.W. Territories. At least two species of wild animals, the fox and wolf, are affected. This constitutes a reservoir from which other animals and man may become infected and, as control measures cannot be undertaken in wild animals over such a vast area, this is likely to remain for many years to come. Vaccination of dogs will give these animals a considerable degree of protection. This will be an important step in the protection of human beings since the latter are most likely to be infected by dogs. The question still remains as to whether Arctic or Northern dog disease is a combination of a number of things or whether the virus of rabies is the sole cause.

—R. GWATKIN.

SAVAGE, A., & ISA, J. M. (1947.) **Northern dog disease. A note on changes in the brains of dogs from Fort Ross, 1946.**—*Ibid.* **11.** 161–162. **1592**

Five out of six dog brains were found suitable for microscopic study. There were no demonstrable lesions in three brains. In two brains from Brentford Bay there were perivascular cuffing and small spherical granules which stained in a manner highly suggestive of Negri bodies; these were not intracellular and were regarded as artefacts. In one of the brains there was evidence of local meningitis.

The findings were interpreted as indicating acute primary encephalitis, probably of virus origin.—P. J. G. PLUMMER.

BURNET, F. M., & MCCREA, J. F. (1946.) **Inhibitory and inactivating action of normal ferret sera against an influenza virus strain.**—*Aust. J. exp. Biol. med. Sci.* **24.** 277–282. **1593**

Normal ferret serum was found to contain an inhibitory substance active against the influenza A strain BEL. This was shown by its antihaemagglutination titre and by its ability to inactivate the virus in the allantoic cavity and in intranasal inoculation in mice. None of the ten ferrets supplying the sera showed any immunity to subsequent infection with BEL O and D type virus.

This inhibitory effect against BEL was similar to that of an immune antibody in that it was resistant to heat. The inhibitory power of the same sera against Melbourne Mouse virus was lost after 20 minutes at 62°C.

Serum fractionation indicates that both normal and immune inhibitors are present in the γ-globulin fraction.—N. WICKHAM.

MCCREA, J. F. (1946.) **Nonspecific serum inhibition of influenza haemagglutination.**—*Aust. J. exp. Biol. med. Sci.* **24.** 283–291. **1594**

The nonspecific inhibitory reactions of normal rabbit serum occurring during haemagglutination work can be eliminated by previous heating of the serum to 62°C. for 20 minutes.

Experiments are described showing the rate of destruction of these elements in normal and immune sera. In immune sera the substances responsible are found to be heat resistant; immune sera prepared against BEL D virus and heated for 20 minutes at 62°C. show 50% of the titre shown before heating, while normal sera treated in the same way show no inhibition.

A high percentage of both the normal and immune inhibitors was recovered from the γ-globulin fraction after precipitation with ammonium sulphate.—N. WICKHAM.

HIRST, G. K. (1947.) **Studies on the mechanism of adaptation of influenza virus to mice.**—*J. exp. Med.* **86.** 357–366. [Author's summary copied *verbatim.*] **1595**

When strains of influenza A virus which have been isolated in chick embryos are introduced into the mouse lung, the virus multiplies readily and achieves initially a titer which is as high as is ever obtained, even after repeated passage. The high initial titer of virus may be unaccompanied by any lethal or visible pathogenic effects; but with four or five mouse passages the agent becomes lethal in high titer and causes extensive pulmonary consolidation, though its capacity to multiply in the lung has not increased. In one example the adaptation to mouse lung was accompanied by increasing capacity to agglutinate guinea pig red cells without a corresponding increase in agglutinating power for chicken cells. Influenza B virus, in preliminary tests, did not behave in a similar fashion.

The adaptation of influenza A virus to mice is accompanied by changes in antigenic pattern, as detected by cross-tests with the agglutination inhibition method. Two strains, initially similar, with passage, changed in pattern along divergent paths so that they became not only unlike the parent strains but unlike each other. This finding has important implications for the interpretation of the strain difference problem in human influenza.

SABIN, A. B., GINDER, D. R., & MATUMOTO, M. (1947.) **Difference in dissemination of the virus of Japanese B encephalitis among domestic animals and human beings in Japan.**—*Amer. J. Hyg.* **46.** 341–355. **1596**

SABIN, A. B., SCHLESINGER, R. W., GINDER, D. R., & MATUMOTO, M. (1947.) **Japanese B encephalitis in American soldiers in Korea.**—*Ibid.* **46.** 356–375. **1597**

Japanese B encephalitis is endemic in the districts of Okayama and Tokyo. No epidemics have occurred, however, in the last five years. A specific neutralizing antibody was found to occur in the sera of 84% of horses, 70% of goats, 31% of cattle and 33% of rabbits which had lived in these areas during the past five years, but to be absent, or nearly so, both in children and chickens.

From previous work it had appeared possible that a complement fixing antibody usually disappeared or decreased to insignificant levels after an unknown period, while the neutralizing antibody persisted, and an instance is now quoted of a two-year-old goat in which the complement fixing antibody had disappeared whilst the neutralizing antibody was still present, indicating that this period might be less than two years. No complement fixing antibodies were found in children without neutralizing antibodies, and in tests of 45 animal sera, 24 of which possessed neutralizing antibodies, only two horses showed a sufficiently high titre to suggest recent infections with the virus.

It was considered that during non-epidemic years the virus of Japanese B encephalitis may undergo extensive dissemination in horses and goats, and to a lesser extent amongst cows and rabbits, at a time when transmission to human beings and chickens is rare or non-existent. This suggests that arthropod vectors, other than mosquitoes, or helminths peculiar to domestic animals may be involved in the transmission of the virus during non-epidemic periods.

The second paper records the occurrence of Japanese B encephalitis in American soldiers in Korea, though no cases were found in the native population. In one case a very high titre of neutralizing antibody occurred in the serum within five days of the appearance of prodromal symptoms, but this did not prevent a fatal outcome. This illustrates the ineffectiveness of antibodies in serum against virus in the central nervous system, and the futility of administering hyperimmune serum after symptoms have developed.

—U. F. RICHARDSON.

AZZI, A. (1944.) Encefalo-mieliti infettive degli animali. **[Infectious encephalomyelitis of animals.]**—*G. Batt. Immun.* **32.** 41–69. **1598**

The encephalomyelites of domestic animals, g. pigs, fowls and the wolf are given with a short description of the main characteristics of each disease.—I. W. JENNINGS.

CANESSA, S. (1946.) Sulla sieroterapia della peste bovina. **[Serum therapy of rinderpest.]**—*Clin. vet., Milano.* **69.** 52–53. **1599**

The author, not obtaining beneficial results from the therapeutic use of hyperimmune rinderpest serum, suggests the simultaneous injection of 200 ml. of fresh healthy ox serum for each 100 ml. of hyperimmune serum in order to supply complement for an antibody-virus union.—W. M. H.

JOHANNSEN, A. (1944.) Sektionsbilden vid svinpest i Sverige under epizootierna aren 1940 och 1943. **[Post-mortem appearances in swine fever in Sweden during the epizootics of 1940 and 1943 (with 44 references).]**—*Skand. Vet-Tidskr.* **34.** 467–494. [English summary.] **1600**

The most significant macroscopic findings were tonsil necrosis, spleen infarction, croupous pneumonia, stomach and intestinal changes of varying extent, haemorrhage of the renal cortex and mucous membrane of the urinary passage. Histological findings were nervous system changes in the form of acute, non-purulent meningo-encephalomyelitis varying in extent.

Of the secondary bacterial infections, *Salmonella* was found in 5% of cases in the 1940 epizootic and in 12% in 1943; *Pasteurella* in 2% and 5% respectively, streptococci in 1% and 2% and *Erysipelothrix rhusiopathiae* in 2% in 1943. Pulmonary infections with *Pasteurella*, influenza virus, streptococci, etc., were also found.

No absolutely specific picture, either macroscopic or microscopic, was demonstrable for swine fever, as the characteristic changes do not appear with any regularity.—F. E. W.

NOVICKÝ, R. (1947.) Ochranné očkování krystal-violet'ovou vakcinou proti moru vepřů ve Venezuele. **[Protective inoculation with crystal violet vaccine against swine fever in Venezuela.]**—*Čas. československ. Vet.* **2.** 217–226. **1601**

The author compared the protective power of the crystal violet vaccine prepared from Venezuelan and U.S.A. viruses. The vaccine prepared from the Venezuelan virus protects in the dose 10–15 ml. 85% pigs infected with 1 ml. of the same virus. The vaccine prepared from the

U.S.A. virus protects in the dose of 10–15 ml. about 95% pigs infected with 1 ml. of the same virus. In both cases the degree of immunity depends on the dose of the vaccine.—E. PŘIBYL.

ZOFIJEVSKÝ, V. 1947. Tlumení moru vepřů vzhledem k dnešním imunoprofylaktickým methodám. [**The eradication of swine fever with reference to the present immunoprophylactic methods.**]—*Čas. československ. Vet.* **2.** 101–105. **1602**

The author discusses the control of swine fever by the sanitary police method, by immunization and by the "slaughter" method in Czechoslovakia. New possibilities from use of the crystal violet vaccine are considered. The following conclusions are submitted :–

The simultaneous inoculation is to be preferred in districts, where the swine fever is endemic. Immunization should be performed only by skilled veterinarians.

The use of serum alone is of problematic value. Its disadvantages are the brief duration of the passive immunity and the uncertainty as to whether the animals inoculated have acquired active immunity.—E. PŘIBYL.

HEDSTRÖM, H. (1944.) Smittvägarna vid svinpest. [**Paths of infection in swine fever.**]—*Skand. VetTidskr.* **34.** 385–415. [English summary.] **1603**

In the epizootics of 1940 and 1943 kitchen refuse containing infected matter (originating from imported salt pork from North and South America) was one of the chief means of spreading the disease. Pig marketing also spread infection, while numbers of cases had occurred where infection was spread by syringes during swine erysipelas vaccination and by human agency. In a few cases infection was transmitted during service of sows and by rats and birds or by infected fodder sacks.

A brief history is given of the paths of infection in some 50 cases.—F. E. W.

TYKAČ, B. (1947.) Nakažlivá obrna a parasitární zamoření vepřů. [**Porcine encephalomyelitis and parasitic infestation in pigs.**]—*Čas. československ. Vet.* **2.** 160–163. **1604**

Worms (*Ascaris*, *Oesophagostomum dentatum* and *Trichuris*) were present in the pigs on 85·2% of 135 farms on which porcine encephalomyelitis occurred, but were found on only 48·3% of 58 farms free from the disease. T. suggests that worms may be related to the incidence of the infection.—E. PŘIBYL.

POKORNÝ, V. (1947.) Vliv ochranného očkování proti července na výskyt nakažlivé obrny vepřů. [**The influence of the preventive immunization against erysipelas upon the occurrence of infectious paralysis in pigs.**]—*Čas. československ. Vet.* **2.** 328–329. **1605**

The outbreaks of infectious paralysis of pigs occur most frequently in cold and wet months in winter and spring. Shortly after the simultaneous inoculation against erysipelas has been finished the occurrence of infectious paralysis is minimal. P. considers that the preventive simultaneous inoculation against erysipelas renders the animals less sensitive to infection with infectious paralysis. The danger of accidental transmission of infectious paralysis is less than that of swine fever. —E. PŘIBYL.

ZÁBOJNÍK, A. (1947.) Nakažlivá obrna vepřů. [**Infectious paralysis of pigs.**]—*Čas. československ. Vet.* **2.** 163–165. **1606**

The author agrees with other workers that active immunization of pigs against erysipelas seems to decrease the number of outbreaks of infectious paralysis in the inoculated herds. The vaccination gave satisfactory results.—E. PŘIBYL.

RUBARTH, S. (1947.) **An acute virus disease with liver lesions in dogs (Hepatitis contagiosa canis). A pathologico-anatomical and etiological investigation.**—*Thesis, Stockholm.* pp. 222. [In English.] Reprinted in *Acta path. microbiol. scand.* Suppl. 69. pp. 222. (1947.) **1607**

P.M. examinations of dogs at the Pathology Department of the Royal Veterinary College, Stockholm, revealed the occurrence of a pathological condition characterized by centrolobular regressive changes in the liver. The author has made a detailed study of this condition, the salient features of which have led to the adoption of the term *Hepatitis contagiosa canis*. The disease had not been recognized as a clinical entity and this investigation is based mainly on 190 cases out of 5,610 P.M. examinations made from 1928 to 1946. 36% of these cases were found in puppies under four months old. Terriers appeared to be more commonly affected than other breeds.

The characteristic P.M. findings were a somewhat swollen liver which was light in colour with a distinct lobular design, a subserous oedema of the gall-bladder, sometimes a subserous oedema of the pancreas and the tissue round the portal lymph nodes, and enlargement of the spleen. Histological examination showed acute hepatitis with centrolobular dilatation of the sinusoids accompanied by necrotic changes, acute splenitis usually with a greatly increased blood content, and frequently inflammatory changes in the lymph nodes. Nuclear inclusions, basophilic or eosinophilic, are described occurring to a varying extent in the liver cells and in the endothelial cells of the liver sinusoids, the hepatic veins, the glomeruli of the kidney, the lymph nodes, the spleen, the

bone-marrow, the brain and spinal cord, and the sinusoids of the adrenals.

Bacteriological examinations gave no reason to suspect a bacterial infection and the author succeeded in reproducing the disease in dogs by the intraperitoneal injection of unfiltered and filtered (Seitz E.K. or Berkefeld N.) suspensions of liver from dogs found affected on P.M. examination. Complement-fixation tests using liver tissue as antigen were made on sera from 100 dogs, 70 of which gave fixation. This last fact combined with difficulty experienced in producing experimental infection in other than laboratory-bred puppies led R. to assume that the disease was widely disseminated and that his P.M. cases represented only a small proportion of dogs infected with a disease of low mortality. His conclusion is that this condition is an infectious and contagious disease caused by a filterable virus. He comments on the P.M. picture described by GREEN & SHILLINGER [see *V. B.* **5.** 720] in their attempts to transmit fox encephalitis to dogs and, because of its similarity to the P.M. condition that he has studied, he further concludes that the same virus is concerned in *Hepatitis contagiosa canis* and fox encephalitis. [This conclusion is not supported by any additional experimental evidence.]—W. M. HENDERSON.

DAVIS, D. J., & EWING, C. L. (1947.) **Recovery of ornithosis virus from pigeons in Baltimore, Maryland.**—*Publ. Hlth Rep., Wash.* **62.** 1484–1488. [Authors' summary copied *verbatim.*] **1608**

Active ornithosis virus identified by morphological and serological studies was recovered from the organs of 15 of 100 adult wild pigeons captured in Baltimore, Md. Infected birds were found within the city at four of eight different capture locations. In spite of the demonstrated prevalence of infection among wild pigeons, the paucity of recognized human ornithosis suggests that wild pigeons do not constitute a serious public health hazard to the population of Baltimore under conditions now prevailing in that city.

ZINTEK, A. R. (1947.) **The rapid infection of a family after introduction of poliomyelitis virus.** —*Amer. J. Hyg.* **46.** 248–253. [Author's summary copied *verbatim.*] **1609**

The results of tests for the harborage of virus among the familial associates of a poliomyelitis patient are reported for intervals before, at the time of, and following onset of the disease.

Virus was not recovered from the throat washings or stools of any member of the family 4 days before the onset of abortive disease. Eight days later an additional member of the family developed paralytic poliomyelitis and at this time virus was recovered from every other member of the family. Two of 4 members harbored virus in their throats, one 4 days after and the other 1 day before onset of abortive poliomyelitis. Three weeks later it was still possible to recover virus from 3 persons. The previously positive stools of a fourth member of the family had become negative.

The possible significance of these findings is discussed.

FINN, S., KORNS, R. F., & BAHLKE, A. M. (1947.) **Exposed dental pulp as a portal of entry for the virus of poliomyelitis.**—*Amer. J. Hyg.* **46.** 177–184. [Authors' summary copied *verbatim.*] **1610**

The published literature on the subject of dental pulp exposure in poliomyelitis has been critically reviewed.

A study conducted in 3 cities in New York State is presented in which the prevalence of dental pulp exposure in patients with poliomyelitis was compared with that in siblings of these patients. Of 70 patients studied 45·7 per cent showed pulp exposure, while among the 119 siblings of these patients 45·4 per cent showed pulp exposure.

Special study of patients with bulbar poliomyelitis failed to show any significant difference in the prevalence of pulp exposure in this group as compared to their siblings.

A survey of 773 school children in a community which had recently experienced an extensive epidemic of poliomyelitis revealed that 352 (45·5 per cent) had dental pulp exposure. In this same community, 45·4 per cent of 22 poliomyelitis patients studied had pulp exposure.

In the study presented no significant difference was found in the prevalence of dental pulp exposure in persons who acquire clinical poliomyelitis as compared to those in the same households who escape the disease.

BOSWELL, F. W. (1947.) **Electron microscope studies of virus elementary bodies.**—*Brit. J. exp. Path.* **28.** 253–260. **1611**

In this study the virus particles, mounted on a plastic film supported by a wire mesh, were placed in a vacuum chamber where evaporating metallic chromium atoms were deposited obliquely on the virus particle. A metallic coating of varying thickness was formed, which accentuated density differences due to small surface undulations. This technique enhances contrasts, renders fine structure visible and gives a 3-dimensional effect which helps in visualizing the shape of the particle. Three different viruses were examined, molluscum contagiosum virus from the excised skin of a human patient, measured 302 × 226 mμ (±15%); fowl pox virus measured 332 × 264 mμ (±28%);

ectromelia virus was estimated to measure 300 × 210 mμ. Variations in measurements occur as a result of drying and distortion by the microscope; in the living state the deviation must be smaller. The height of the viruses was approximately ⅓ of their length. There was no evidence of budding or binary fission and photographs magnified 100,000 times did not show limiting membranes.

—MALCOLM WOODBINE.

CRAWFORD, M. (1947.) **Papers presented to congress. No. 3. The immunology and epidemiology of some virus diseases.**—*Vet. Rec.* **59.** 537–540. Discussion pp. 540–548. **1612**

The paper stresses initially the idea of a virus disease as a manifestation of a host-parasite relationship. The use of virus modified by passage through an unusual host is discussed with special regard to the viruses of goat-adapted rinderpest, of mouse-adapted horse sickness and ferret-adapted distemper.

With regard to the goat-adapted virus it is possible that the reacting cattle can pass on infection to other cattle, to buffaloes, etc. Consequently there may be danger inherent in artificial adaptation of a virus to a new host. Loss of attacking power may occur in the course of artificial passage through a number of generations.

The interference phenomenon is briefly discussed with reference to rinderpest and distemper. Unfortunately nothing is known about the nature of the reaction between virus and susceptible cell. Newcastle disease is considered—it has certain points of resemblance to fowl plague, although with the exception of England, early outbreaks occurred in countries without a past history of fowl plague. It has spread to all five continents rapidly since it was first recognized in 1926 in the Dutch East Indies. The disease has different behaviour in America as compared with other countries, and it is suggested that the true host of the virus may be some species of American wild bird.

With regard to the low mortality of Newcastle disease among American poultry it was suggested that this results from a character of the virus and not from a character of the host. The occurrence of more than one immunological type was also noted where immunity acquired to one type leaves the host fully susceptible to infection with strains of another type.

Vaccination of young stock should be delayed until all trace of acquired passive immunity has disappeared.

The conditions under which foot and mouth disease-infected cattle and contacts were slaughtered, rendered it very difficult, if not impossible, to obviate risk of spreading infection to further livestock, if they were used for human food.

—P. S. GORDON.

See also absts. **1626** (neoplasms); **1644** (rinderpest); **1645** (wild animals); **1704** (foot and mouth disease).

IMMUNITY

MCGIRR, J. L. (1947.) **Colostral transmission of antibody substances from mother to offspring.**—*Vet. J.* **103.** 345–356. **1613**

The colostrum is of major importance as regards the transmission of maternal antibodies in the following species:—cow, horse, pig, sheep, goat, dog, mouse and rat. Direct placental transmission is the natural route in the g. pig, rabbit and in man.

In the former group the colostrum has initially a relatively high content of protein, which includes specific antibodies, and these can only be absorbed by the digestive tract of the offspring for a relatively short period following birth, for about 24 hours' duration in the calf and less than four days in the lamb and kid.

In the case of *Br. abortus* all calves are born without agglutinins, but those from immune cows receive a varying amount of antibody in the colostrum during the first 24 hours. The period during which these agglutinins persist in the serum of the calf depends on the titre of the colostrum but they eventually disappear in from two weeks to six months.—J. KEPPIE.

ECKER, E. E., HIATT, C. W., & BARR, L. M. (1947.) **Effect of pregnancy on the complement of guinea pigs.**—*J. Lab. clin. Med.* **32.** 287–291. [Authors' summary copied *verbatim.*] **1614**

Pregnancy in the guinea pig is accompanied by a substantial decrease in complement activity of the serum. After parturition complement activity gradually increases toward the level normal for nonpregnant female guinea pigs.

LUBINSKI, H. H., & PORTNUFF, J. C. (1947.) **The influence of heat and formalin upon the Rh agglutinogen.**—*J. Lab. clin. Med.* **32.** 178–180. [Authors' summary copied *verbatim.*] **1615**

Heating of red cells to 56°C. for five to twenty minutes diminishes or destroys their agglutinability by anti-Rh agglutinating and blocking sera, whereas the agglutinability and anti-A, anti-B, anti-M, and anti-N sera is apparently not affected.

Addition of formalin (0·1 to 1·0 per cent) to red cell suspensions reduces the agglutinability by anti-Rh serum much more than the agglutinability by anti-A or anti-B sera.

MAALØE, O. (1947.) **On the dependence of the phagocytosis-stimulating action of immune-serum on complement.**—*Acta path. Microbiol. scand.* **24.** 33–46. [In English, author's summary slightly amended.] **1616**

A survey of the Neufeld tropin-theory and of the attention paid to it in recent literature is given.

By means of a special technique, which is thoroughly described in a recent publication, Maaløe (1946), it has been proved that *no* concentration of immune-body is able by itself to promote phagocytosis and that addition of complement in concentrations above or equal to about 1 : 10000 " activates " the immune-body, and that *the combined action of immune-body and complement* always strongly promotes phagocytosis.

It is shown how the three " kinds " of phagocytosis, which are met with in all *in vitro* experiments, are easily distinguished. Evidence is brought forward in support of the idea that the phagocytosis-stimulating immune-body is identical with other immune-bodies (in this case the agglutinating immune-body).

In conclusion a simplified terminology is proposed for descriptions of antibacterial reactions in which complement is concerned.

See also absts. **1552** (strangles vaccine); **1553-1555** (anthrax); **1575-1576** (brucellosis); **1578** (*Cl. welchii*); **1601, 1602** (swine fever); (anti sera, toxoids and vaccines).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

BLANC, G., & BALTAZARD, M. (1947.) Contribution a l'étude du comportement des microbes pathogenes chez les insects hematophages. Troisième mémoire. **[The behaviour of pathogenic micro-organisms in haematophagous insects. Part 3.]**—*Arch. Inst. Pasteur Maroc.* **3.** 463–475. **1617**

In four experiments conducted with *Pseudomonas pyocyanea* in the flea, *Xenopsylla cheopis*, the organism behaved as other pathogens tested with this flea. The flea became infected after feeding on an inoculated g. pig and might remain infected up to 38 days. Exposure of g. pigs to infected fleas over a period of several days did not result in infection. Exposure of a limited area of skin to 500 fleas for a varying number of times showed, however, that the organism was transmitted by biting, as proved by culture of the subcutaneous tissues. The faeces of the flea were found to be infected.

It was also found possible to transmit *Br. tularense* by the bite of this flea.—A. LOOSMORE.

REMPEL, J. G., & ARNASON, A. P. (1947.) **An account of three successive outbreaks of the black fly, *Simulium arcticum*, a serious livestock pest in Saskatchewan.**—*Sci. Agric.* **27.** 428–445. **1618**

Three great outbreaks of the black fly, *Simulium arcticum*, occurred in Saskatchewan in 1944, 1945 and 1946, causing considerable livestock losses over extensive areas. Other outbreaks have occurred previously in the same areas, notably in 1919 and 1930. The three outbreaks and consequent livestock deaths occurred suddenly in late May and early June, and evidence is produced that the causative flies originated from breeding grounds on rocky beds forming suitable rapids at points on the South Saskatchewan river between Prince Albert and Saskatoon. The flies were windborne for distances of 20–60 miles from the river, thus causing livestock deaths in districts free from blackfly breeding grounds. The history of a typical outbreak in 1946 was as follows :– on June 2, vast numbers of flies were borne into the district from a distance of 30–60 miles, by south easterly winds. Animals died on June 2 and 3. On June 5 the attack was terminated by cool weather, rain, and reversal of wind direction.

In all three outbreaks the main losses occurred in cows and bulls, fewer losses occurred in other livestock such as horses, sheep and pigs. Animals with hairless regions were most susceptible, since flies congregated on such areas to insert their short mouth-parts. This explains why calves, which have more hairy and complete coats suffered fewer deaths than older animals. In some outbreaks, recently shorn sheep were killed, while unshorn sheep with little exposed skin escaped. During outbreaks the flies congregated in vast numbers on bare areas, causing myriads of minute skin punctures, so that affected parts appeared raw. The bite of the fly is not painful at the time it is inflicted, aching and pain occurring later. The clinical manifestations of the attack were :– oedematous lesions at the site of bites, and in some cases dropsical swellings in the region of the throat, and in sheep and horses, similar swellings in the subcutaneous tissue of the chest and sternum. Depth of breathing was markedly increased in animals severely attacked. In late fatal cases breathing was jerky. Deaths occurred within 24 hours of the appearance of the flies in quantity. P.M. examination revealed accumulation of clear serous fluid both in the body cavities and tissues along with internal haemorrhages. The authors interpret this as evidence of shock due to direct toxic action, without previous sensitization.

Control of *Simulium arcticum* is at present impracticable by destruction of the aquatic eggs and larvae, using miscible oils or larvicides. Stock should be kept in dark buildings during

outbreaks, and animals on pasture protected with smudges. Repellent mineral oils and greases gave protection when applied daily.—L. D.

DU TOIT, R. (1947.) **Ticks and tick-borne diseases. Part 1. The Argasidae and Ixodidae.** —*Fmg. S. Afr.* **22.** 408–423. **1619**

This paper gives an account of 17 species of ticks that are of importance as livestock pests in South Africa. Most of the species are figured and descriptions are given of the various stages in each case, so that identification of specimens is possible. The account of each species includes the main features of the life history, and the known relationship of the particular tick to livestock diseases in South Africa.—L. DAVIES.

ROBERTS, F. H. S. (1947.) **Ticks infesting domestic animals in Queensland.**—*Qd. agric. J.* **64.** 233–244. **1620**

The general structure and life-history of ticks are discussed and there are specific notes on *Argas persicus*, *Ornithodorus gurneyi* (inornate kangaroo tick), *Ixodes holocyclus*, *Rhipicephalus sanguineus*, *Boöphilus annulatus microplus*, *Haemaphysalis bancrofti* (wallaby tick), *Haemaphysalis bispinosa*, and *Amblyomma triguttatum* (ornate kangaroo tick).

The rarer species noted are *Ixodes tasmani* (opossum tick), *Haemaphysalis humerosa* (bandicoot tick), the snake and lizard ticks, *Amblyomma moreliae* and *Aponomma trachysauri*, the echidna tick *A. hydrosauri* and *A. gervaisi*. There is a table for differentiating the commoner species.

—H. McL. GORDON.

FENNER, F. (1946.) **The epidemiology of North Queensland tick typhus: natural mammalian hosts.**—*Med. J. Aust.* **2.** 666–668. **1621**

The presumed vector of this rickettsiasis is *Ixodes holocyclus*. Serum from the following marsupials reacted in complement fixation tests with an antigen prepared from yolk-sacs infected with the rickettsia: bandicoots (*Isoodon* and *Perameles*), opossum (*Trichosurus*) and rat kangaroo (*Ae. pyprymnus*). A rodent, *Uromys sherrini*, also yielded positive results.—H. McL. GORDON.

MELLANBY, K. (1947.) **Sarcoptic mange in the alpaca, *Lama huanaco* var. *paca*.**—*Trans. R. Soc. trop. Med. Hyg.* **40.** 359. **1622**

The South American domestic alpaca (*Lama huanaco* var. *paca*) is subject to sarcoptic mange resembling crusted or Norwegian scabies in man. Experiments showed that mites from the alpaca attacked man and gave similar reactions to human *Sarcoptes*, although there was a suggestion that they were more reluctant to burrow than mites from human beings. This supports the conclusion that there is only one species of *Sarcoptes*, which can be divided into several biological races.—L. D.

See also abst. **1562** (mosquitoes); **1669-1673** (D.D.T.); **1679** (blowfly); **1681** (houseflies); **1682** (sheep keds); **1683** (ticks); **1726** (annual report).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

DE VERA, V. R. (1947.) Contribución al estudio de la hidatidosis cardiaca en los vacunos y ovinos. **[Echinococcus cysts in the heart muscle of cattle and sheep.]**—*Gac. vet., B. Aires.* **9.** 9–28. **1623**

A discussion on echinococcus cysts in the heart muscle of cattle and sheep. The path followed by the parasite from the intestine to the heart muscle is referred to, but no new information is given.—F. A. ESTEVES.

ALLEN, R. W. (1947.) **The incidence of *Capillaria annulata* in chickens of the Middle West.**—*Proc. helminth. Soc. Wash.* **14.** 87–88. **1624**

Forty-three (9·3%) of the crops from 463 chickens were found to harbour *C. annulata*. In 24 of these crops, the average number of worms was 7·7 with a ratio of 1 male to 2·2 females. These findings constitute additional evidence of the widespread distribution of this parasite in America.—J. D. BLAXLAND.

MARSH, T. D., & KANAGRATNAM, N. (1947.) **Kidney worm of pigs. Effects of feeding banana stems to infested pigs.**—*Malay agric. J.* **30.** 55–63. **1625**

Chinese pig keepers believe that feeding cooked banana stems ameliorates the effect of the kidney worm, *Stephanurus dentatus*, on the host pig.

Eight pigs known to be excreting eggs of the worm were divided into two groups. One comprising four female pigs was fed an adequate ration which included banana stems. The control group comprising three castrated male pigs and one female, was fed an adequate ration without the cooked banana stems. It was concluded that banana stems did not possess any specific anti-helmintic properties but it was found that in the recipients when examined P.M. after about eight months, the livers and kidneys were healthier than in those of the other group.

Hygiene in the stye gradually eliminates a moderate infection in adult pigs since it appears that the mature parasite exists in the pig only for a few months.—S. BRIAN KENDALL.

See also **1684** (sodium fluoride as anthelmintic); **1685** (strongylosis); **1686** (ascaris); **1726** (annual report).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

AZZI, A. (1948.) Processi proferativi e neoplasma-simili da agenti morbigeni della natura degli infravirus o infraviro-simili. **[Proliferative processes and neoplasm-like growths due to viruses or virus-like agents.]**—*G. Batt. Immun.* **31.** 334–375. **1626**

A review giving a descriptive summary of the following conditions, the aetiology of some being still obscure: acute rheumatoid arthritis; chronic pemphigus; Pfeiffer's glandular fever (infectious mononucleosis); Hodgkin's disease; benign lymphogranuloma; lymphogranuloma inguinale; mumps (epidemic parotitis); salivary gland disease of rodents; virus III infection of rabbits; warts (verrucae); molluscum contagiosum; infectious myxomatosis of rabbits; infectious papillomatosis of rabbits; infectious fibromatosis of rabbits; Rous sarcoma of fowls; leucosis of fowls; renal adenoma of *Rana pipiens*; warts of *Discoglossus pictus*; lymphocytosis of fish; and variola of fish.—W. M. HENDERSON.

NUTRITIONAL AND METABOLIC DISORDERS

MOULE, G. R. (1946.) **Some problems of wool production.**—*Aust. vet. J.* **22.** 188–197. Discussion: pp. 197–198. **1627**

M. discussed the cost of production, environmental influences, effects of plane of nutrition and reaction of strains of sheep to environmental conditions, in wide terms. In this paper there is much of value for the veterinarian who is interested in animal husbandry, nutrition and climotological effects on sheep.—H. McL. GORDON.

HARE, T. (1947.) **Diet and canine hysteria [Correspondence].**—*Brit. med. J.* 5th April. p. 467. **1628**

H. discusses Mellanby's [see *V. B.* **17.** 33] results and refers to his own observations on canine hysteria which may occur in the course of a particular infection such as β-haemolytic streptococcus infection plus the presence of roundworms (*Toxascaris* sp. and/or *Toxacara* sp.). H. accepts M.'s diagnosis of his dogs' behaviour as canine hysteria, but does not agree as to the causation of the condition.—E. M. J.

MELLANBY, E. (1947.) **Further observations on the production of canine hysteria by flour treated with nitrogen trichloride (agene process).**—*Brit. med. J.* August 23rd. 288–289. **1629**

M. refers to his earlier paper [see *V. B.* **17.** 33] in which the use of the agene process which involves the use of nitrogen trichloride in the course of flour milling in order to bleach and "improve" the flour, that is to produce a whiter bread than is made when untreated flour is used and to improve its baking qualities. Possibly up to as much as 90% of the flour used for white bread in the United Kingdom is agenized. The process appears to be somewhat in the nature of a trade secret as there was some difficulty in obtaining information concerning its use.

Dogs fed on the flour developed a syndrome stated to be canine hysteria, the flour used having been treated with 8 g. NCl_3 to 127 kg. of flour (6·3 mg. per 100 g.).

The toxic action of the agenized flour was traced to the gluten and a further study was made to find whether the toxicity was associated with the gliadin or glutelin fraction. When either the gliadin or the glutelin fraction, prepared from the gluten of agenized flour was added to the diet of the dogs, the syndrome was produced, but the toxicity of the glutelin was definitely less than that of the gliadin. When the gliadin and glutelin fractions were added together to the diet, the effect was similar to that produced by a corresponding amount of the original gluten and severe symptoms developed.

Reference was made to the fact that the nervous symptoms had not been observed in rats or mice fed on agenized flour, but typical symptoms were produced in ferrets whether fed on agenized flour or on gluten prepared from it. Unagenized flour from the same source produced no abnormal symptoms. The affected ferrets were more drowsy than usual and were more vicious when handled than normal animals. In severe cases they dashed round the cages, running into the sides and true epileptiform fits developed. Ferrets were not, however, as susceptible as dogs to nervous abnormalities.—E. M. J.

MORAN, T. (1947.) **Nitrogen trichloride and canine hysteria.**—*Lancet.* **253.** 289–291. **1630**

MELLANBY [see preceding abst.] found that flour of 80–90% extraction which had been treated with nitrogen trichloride in amounts frequently used by millers for bleaching and improving flour, produced hysteria in dogs within 2–4 weeks. NCl_3 is used commercially in the proportion of 2·4 mg. per 100 g. for white flour of 70% extraction and 6·4 mg. per 100 g. for flour of 85% extraction.

Using flour which had been treated with NCl_3 at the rate of 80 mg. per 100 g., Moran found

that hysteria was produced in dogs within 24 hours. The toxic agent was associated with the protein fraction, and this toxicity was produced not only by interaction of NCl_3 with wheat proteins, but also with casein, zein and gelatin, the substances so formed giving rise to canine hysteria. When the dogs were given similar diet which had not been treated with NCl_3, the symptoms rapidly disappeared.

In the production of the toxic substance the NCl_3 appears to react with a particular structure in the protein molecule in which glycine, tryptophane and lysine are not involved.—E. M. J.

ANON. (1947.) **Agene and canine hysteria.**—*Brit. med. J.* December 13th, 963–964. **1631**

This is a discussion of the investigations of Mellanby and Moran [see preceding absts.].

SILVER, M. L., JOHNSON, R. E., KARK, R. M., KLEIN, J. R., MONAHAN, E. P., & ZEVIN, S. S. (1947.) **White bread and epilepsy in animals.**—*J. Amer. med. Ass.* **135.** 757–760. **1632**

Dogs which were fed a nutritionally adequate diet containing 75% of heavily agenized (30 g. per cwt.) white wheat flour developed clinical epilepsy. When electroencephalograms were recorded daily, a cerebral dysrhythmia indistinguishable from that of human epilepsy appeared within 48–72 hours. Monkeys developed asynergy, weakness and tremors sometimes accompanied by cerebral dysrhythmia; in cats there was marked ataxia and in rats a reddish pigment appeared around the eyes and nose.

Protein fractions of wheat gluten, glutenin and gliadin, and other proteins such as lactalbumin and casein which have been treated with agene become toxic when fed to dogs [see also MORAN, abst. 1630]. Mixtures of synthetic amino acids or individual amino acids such as cysteine and cystine, so treated, when injected intravenously caused seizures.—E. M. J.

NEWELL, G W., ERICKSON, T. C., GILSON, W. E., GERSHOFF, S. N., & ELVEHJEM, C. A. (1947.) **Role of "agenized" flour in the production of running fits.**—*J. Amer. med. Ass.* **135.** 760–763. **1633**

In dogs receiving various kinds of unbleached wheat flour in their diet during a period of 84 days, no hysteria developed, but when agenized flour was fed to the extent of 84% of an otherwise adequate diet, fits appeared after times corresponding to the proportion of agene used in the flour. 1 g. of agene per cwt. of flour produced fits in 13–39 days, 20 g. of agene per cwt. of flour caused fits in 3–5 days.

A ration containing 30% flour treated with 1·2 g. agene per cwt. flour, this being comparable in flour content to the level of flour included in the average American diet, was fed to dogs for 12 weeks without the appearance of fits. In the U.S.A. agene is added commercially at levels of 1·2–2·5 g. per 100 lb.

In monkeys fed highly agenized whole wheat flour rations, there were changes in the electroencephalographic patterns but there were none of the clinical signs of hysteria. The agenized flour had no ill effects on rats, chicks or g. pigs, but convulsive seizures were caused in cats.

In five human beings aged 6–16 years, wheat products treated with 3–20 g. of agene per cwt. were given in amounts of 70–105 g. daily for 2–4 weeks, but no electroencephalographic abnormalities or symptoms resembling hysteria were observed.—E. M. J.

ANON. (1948.) **The toxicity of agenized flour.**—*Brit. med. J.* May 1st. 843. **1634**

This is a discussion of the investigations of SILVER *et al.* and ELVEHJEM *et al.* in the U.S.A.

PARRY, H. (1948.) **Canine hysteria and wheat.**—*Lancet.* **254.** 32–34. **1635**

P. reviews the literature on canine hysteria and discusses the condition. He considers that the disease is one of a group of psychomotor anxiety states which may be associated with a variety of aetiological factors, difficult to distinguish on clinical data alone. In his opinion canine hysteria is due to the ingestion of hysteriagenic diets and he states that it can be produced experimentally by the ingestion of wheat gliadin, gluten or flour treated by the agene process. The primary hysteriagenic factor seems to be a toxic agent, which is produced, or whose action is increased by agenizing wheat flour. This factor is not a deficiency of protein or of any other known nutrient.

Neuropsychological, dietetic and metabolic factors, in themselves without primary hysteriagenic potency can be important hysteria precipitating agents.—E. M. J.

KORNBERG, A. (1946.) **Amino acids in the production of granulocytes in rats.**—*J. biol. Chem.* **164.** 203–212. **1636**

Albino rats which, after weaning, had been fed upon a protein free diet, developed granulocytopenia after an average of 21 days, in most cases before severe anaemia became apparent. This condition was considered to be present when polymorphonuclear granulocytes numbered 500 or fewer cells per c.mm. Treatment to correct granulocytopenia was started on the day it was detected and a count of 2,000 cells per c.mm. or more, after four days, was regarded as a significant response. Proteins appeared to give no response in the absence of folic acid, this substance was therefore added to the diet in all cases. Casein

or egg white was effective, and casein treated with hydrogen peroxide in formic acid solution, to destroy methionine and tryptophane, if methionine and tryptophane were added; dried human plasma required the addition of isoleucine; zein and gelatin were ineffective even when supplemented; a mixture of ten essential amino acids was effective, the only one of these which could be omitted was arginine. Similar effects upon erythrocyte and leucocyte regeneration were indicated but the duration of the experiments was not long enough to cover adequately the slower regeneration of these cells. There was a clear indication that diets containing 50% of casein or 18% of amino acid mixture were relatively more toxic to these protein deficient rats than diets containing 18% of casein or 8·7% of amino acids.

—R. MARSHALL.

—. (1947.) **Investigations into the etiology and control of enzootic (toxaemic) jaundice. Report of the investigation committee for the year 1946/47.**—*Aust. vet. J.* **23.** 253–261. **1637**

A low copper content of plants was found to accompany a low incidence of toxaemic jaundice and a higher mortality rate occurred in sheep when they had access to heliotrope (*Heliotropium europaeum*). Increase in molybdenum intake in plants occurred when molybdenum was supplied, particularly if the reaction of the soil was changed from acid to alkaline. This did not occur in the heliotrope plant. The administration of molybdenum to plants did not reduce the copper intake of the plant but molybdenum administered to sheep caused a reduction in the copper content of their livers.

In pot experiments the copper content of pasture plants was increased in acid soils but that of molybdenum was reduced, and on the basis of these findings the hypothesis is advanced that the high copper values in the livers of sheep affected by toxaemic jaundice is largely dependent on a high copper/low molybdenum intake by the animal and that this condition is brought about by a soil acidity lower than about pH5. Severe outbreaks of the disease occurred on subterranean clover-dominant pastures after heavy rain.

To reduce the incidence of the disease in affected areas stockowners are recommended to encourage grass-dominant pasture, avoid grazing on clover-dominant pastures after good autumn rains, maintain a high level of nutrition and avoid disturbing the animals as much as possible when the copper content of their livers is likely to be high.

A salt lick containing ammonium molybdate can be used with caution to prevent the disease. As is the case with most licks, some sheep are likely to take no lick, and others too much.

The study is continuing of a number of major points associated with the disease.—D. C. BLOOD.

BODDIE, G. F. (1947.) **Trace element deficiency in livestock in the Hebrides.**—*J. comp. Path.* **57.** 52–61. **1638**

A description is given of a condition affecting cattle and sheep in the various islands of the Hebrides. The clinical syndrome includes debility and inanition with unsatisfactory rate of growth, and the condition appears to be confined to animals grazing machair or sandy areas and preventable or alleviated by transferring the stock to black peaty areas on the same or adjacent islands. The soils of affected areas on chemical examination were found to be highly calcareous sands, of presumably adequate total and exchangeable K and P contents. Results of analysis of the herbage also gave satisfactory Ca, P, K, Mg, Na and Mn contents, but below the generally accepted critically minimal values for Co, and with a rather borderline Cu content. The Co content of the soil was presumably adequate but it is suggested that this element is rendered unavailable because of the high $CaCO_3$ content.

The chief experimental evidence of a Co deficiency in the stock was meagre, as an incomplete uncontrolled experiment to observe the effect of feeding a Co supplement to the stock was inconclusive, but the crofters were of the opinion that it resulted in improvement of appetite and development.

There was no evidence that Cu was concerned in the aetiology of the disease. The condition is discussed in relation to " pining " in sheep in other parts of Scotland.—A. EDEN.

BOTIJA, C. S. (1940.) Contribución al conocimiento de la osteodistrofia fibrosa en España. La enfermedad de los caballos reproductores de la Sección de Sementales del Ejército, de Trujillo (Cáceres). [**Equine osteodystrophia fibrosa in Spain.**]—*Trab. Inst. Biol. anim., Madrid.* **5.** 19–59. [English, French and German summaries.] **1639**

An enzootic focus of osteodystrophia fibrosa in a group of stud horses is described, due to a deficiency of calcium in the diet, the Ca : P ratio being 1 : 4. Unless treated or moved to other districts, affected animals invariably died. Correction of the Ca : P imbalance prevented the onset of the disease, cured the early cases, and arrested the bony changes but did not reduce the deformities in the more advanced cases.

The clinical features are described in three phases. In the first phase, during the onset of the disease, there are no symptoms. The appearance of clinical symptoms marks the opening of the second phase. Animals become weak, easily

tired and respond lazily to stimuli. They show lameness and locomotor inco-ordination as a result of lesions in the bones. Difficulty in rising and weakness of the hindquarters are attributed to disturbance of the nervous system. Transient attacks of arthritis and synovitis are seen. A good diagnostic sign is said to be tremors and fibrillary contractions of the musculature of the extremities without apparent cause. These often develop into rigors and general muscular spasms resembling hypocalcaemic tetany. Towards the end of the second phase there is a predisposition to fractures. The third phase is marked by accentuation of the foregoing symptoms and the onset of the deformation of the bones of the face, skull, scapulo-humeral joint, vertebral column and the ends of some of the long bones.

P.M. and histological features are described shortly. No microscopical changes were found in the spinal medulla or in the thyroid or parathyroid, which could be attributed to the disease.

—I. W. Jennings

Sandstedt, H., Obel, A.-L., Sjöberg, K., & Karlsson, K.-F. (1946.) Undersökningar över den tidiga földödlighetens orsaker. [**Research on causes of early death in foals.**]—*Skand. VetTidskr.* **36.** 259–310 & 321–351. [English summary.] **1640**

Vitamin A deficiency is considered by the authors to be a very common factor in the cause of early death in foals. In 44·5% of the cases examined no vitamin A was present in the liver, and in 82% pathological examination showed skeletal changes indicating vitamin A deficiency, apparently caused by unbalanced diet, consisting mostly of timothy hay or grass which contains less carotene, minerals and protein than clover or alfalfa hay. Faulty treatment of hay (too intensive sun drying, for instance) destroyed the carotene.

Hyaline muscle degeneration was evident in 28·8% of the cases examined. The aetiology was not clear, but the condition was thought to be due to several causal factors.

With regard to anaemia and suprarenal gland haemorrhages, no definite solution could be reached and further investigation was needed.

Mineral deficiency, especially of calcium, shown by analysis of hay, should be counteracted in order to raise resistance.

Bacterial infection could not be proved in about a quarter of the cases, but the significance of corynebacterium, salmonella, etc., as specific aetiological factors should be considered, though deficiency diseases, especially vitamin A deficiency, were proved in several cases of bacterial infection and the authors believe them to be predisposing factors.—F. E. W.

McGinnis, J., & Carver, J. S. (1947.) **The effect of riboflavin and biotin in the prevention of dermatitis and perosis in turkey poults.**—*Poult. Sci.* **26.** 364–371. **1641**

Turkey poults fed a diet low in riboflavin composed of natural ingredients like ground wheat, yellow maize, oats, mill run, and fish meal grew poorly, developed severe dermatitis, a high incidence of perosis and poor feathering. Supplements of riboflavin or riboflavin-rich foods prevented these symptoms. In addition to riboflavin biotin seemed to be necessary only for the prevention of perosis. Experiments conducted with 1% marfanil (*p*-aminotoluene sulphonamide hydrochloride) in the diet produced similar symptoms which could be prevented by riboflavin supplements. The higher incidence and severity of deficiency symptoms in poults bred from turkeys fed on diets low in riboflavin indicates that the diet of the previous generation is very important.—E. Kodicek.

Rek, L. (1947.) Choroby z porušené výživy. [**Nutritional diseases and disorders.**]—*Čas. československ. Vet.* **2.** 75–78. **1642**

The common symptom of nutritional disorders in cattle is depraved appetite (pica), from deficiency of proteins, phosphorus, sodium, copper, cobalt, acid-base balance and from excessive intake of potassium and phosphorus.

—E. Přibyl.

Nelson, M. M., van Nouhuys, F., & Evans, H. M. (1946.) **Lactation leucopenia in rats on purified diets.**—*Proc. Soc. exp. Biol., N.Y.* **61.** 74–75. **1643**

In adult stock rats maintained on stock diets there was no change in the white blood cells during three weeks lactation period. Maintenance on a diet (given as diet no. 836 composed of chemically pure ingredients and calculated to be complete with regard to calories, vitamins, protein, carbohydrates, etc., paper should be consulted for details) during the same period resulted in a marked leucopenia and granulocytopenia by the twenty-first day. Daily supplements of brewers' yeast or liver extract resulted in improvement but not entire prevention of the blood condition.—J. M. Robson.

See also abst. **1726** (annual report); **1732** (science of nutrition—text-book).

DISEASES, GENERAL

Lo, C.-S. (1947.) **Some infectious diseases of domestic animals in China. I. Cattle.**—*J. Amer. vet. med. Ass.* **111.** 272–273. **1644**

Rinderpest is more prevalent than any other

disease in China. Over a million cattle died during 1943 in Ching-hai. Immunization with vaccine is practised. The vaccine is prepared by Kelser's method but the attenuating agent varies, chloroform, glycerin or formalin being used by different laboratories.

Using 25 animals (native cattle and buffalo) infection with rinderpest goat virus (Mukteswar strain) at Yungchang, Szechnan, gave reactions resembling natural infection. Severe rinderpest reactions occurred in Kansu while using Indian goat virus on 1,000 cattle, Yaks and "pien niu" (a cross between native cattle and yaks). Chicken embryo vaccine imported by UNRRA has been used but its production in China is not considered a practical proposition. Japanese workers have developed a lapinized vaccine and it is said this has been used extensively in north China, with favourable results. Reactions are only thermal. The method of production is simple and the cost low.

Tuberculosis rarely occurs in native cattle and buffaloes but up to 20% of dairy cows, pure bred or grade animals, in China are estimated to be infected. In other herds there may be 50% infection.

Brucellosis has only been reported in 10% of dairy herds in Shanghai. In other parts no reactions occurred among 246 native cattle examined or among 404 dairy cows.

Encephalomyelitis is enzootic and sporadic in Szechuan only affecting buffaloes. It is not contagious and the mode of infection is not known. Mortality is 100%.

Bovine contagious pleuro-pneumonia occurs in the North East Provinces (Manchuria). Outbreaks occurred in 1931 in Shanghai.

Anthrax is prevalent throughout China. Blackleg is a rare disease.

Other diseases which occur are tetanus, white scour in calves, haemorrhagic septicaemia, actinomycosis (rarely) and surra in buffaloes.—J. A. G.

DU TOIT, P. J. (1947.) **Game in relation to animal diseases.**—*J. S. Afr. vet. med. Ass.* **18.** 59–66. **1645**

Wild animals are in many instances susceptible to the same diseases as domestic stock. This paper discusses the problem as it arises in Africa.

Rinderpest, since 1890 one of the most important diseases of cattle in Africa may be contracted by species of game, the buffalo, kudu, waterbuck, reedbuck, warthog, and bushpig being particularly susceptible. It is suggested that the presence of game is largely responsible for the continuance of rinderpest in East and West Africa in spite of widespread vaccination of the cattle. It has been established that young cattle frequently fail to be immunized by the goat-virus commonly used in East Africa. In one of the larger outbreaks of rinderpest it is believed that the erection of a 300-mile game fence with a game-free corridor prevented the spread of the disease from Tanganyika into Northern Rhodesia and Nyasaland.

The incidence of diseases caused by trypanosomes is influenced by the numbers of wild animals which act both as reservoirs of infection and as food for the tsetse fly.

Outbreaks of F. & M. disease, malignant catarrh (snotsiekte) of cattle, swine fever in South Africa and rabies have often been traced to disease among the wild mammals. The author concludes that game must be controlled and reduced when necessary but with due regard to its value as an irreplaceable asset. Adequate game reserves must be established away from settled areas and the personnel responsible for the reserves must include members with scientific training.—S. BRIAN KENDALL.

KURAPOV, P. M. (1944.) Vospalenie predlopatochnykh i pakhovykh uzlov u molodykh loshadeĭ. **[Inflammation of pre-scapular and inguinal lymph nodes in young horses.]**—*Veterinariya, Moscow.* No. 4. pp. 33–34. **1646**

A disease of young horses 1–4 years old is described as having been encountered in various parts of Russia. It is characterized by an inflammatory swelling of one or other shoulder, in the region of the pre-scapular lymph nodes. The area may become oedematous with the swelling extending to the brisket, and sometimes to the neck, making it difficult to lower the head. The condition occurs in the spring shortly after the young horses are put out to pasture, and runs its course in about a month. The number of affected animals may reach 100% of the young stock, but on farms where the disease has been severe in previous years fewer animals are affected, and the spread is more gradual, suggesting that a previous attack confers immunity.

The swelling may resolve, or an abscess may form, with recovery after rupture. The application of turpentine is said to delay recovery, but under treatment with ichthyol ointment recovery may occur in 1–2 weeks.

A note by the editor suggests that the condition is connected with the bites of ticks, but asks that as much information as possible be collected to facilitate a scientific investigation.—U. F. R.

LAWRENCE, D. A. (1946.) **Sweating sickness.**—*Rhod. agric. J.* **43.** 505–509. **1647**

As the name implies the most characteristic symptom is profuse sweating. The disease is of unknown aetiology but is definitely related to atmospheric temperature, occurring in Rhodesia

during the hot months of January-March. Normally calves up to six months are affected, but two cases in older cattle, one a cow of about two years, are described. The disease appears to be infectious but all attempts at artificial transmission have failed. It is considered likely that dietary deficiency has at least a predisposing effect and liver extract appears to have a beneficial effect in affected animals. In Northern Rhodesia good results were reported following intravenous injection with 10 ml. of 25% formalin. Controlled experiments are difficult to arrange.—S. B. K.

VERLINDE, J. D., & WINSSER, J. (1947.) Over een geval van maligne reticulo-endotheliose bij den hond. [**A case of malignant reticulo-endotheliosis in the dog.**]—*Tijdschr. Diergeneesk.* **72.** 110–113. [English, French & German summaries.] **1648**

The authors describe a case of malignant reticulo-endotheliosis, with localizations in the skin, the regional lymph nodes and the peritoneum, in a six-year-old fox terrier. The clinical and histological picture closely resembled malignant granuloma (mycosis fungoides) in man.—F. E. W.

RUBARTH, S. (1945.) Bidrag till den patolog-anatomiska bilden och etiologin vid den s.k. toxiska leverdystrofin hos hund. [**Pathology and aetiology of toxic liver dystrophy in dogs.**]—*Skand. VetTidskr.* **35.** 356–361. [English summary.] **1649**

In the livers of dogs with so-called toxic liver dystrophy, R. demonstrated intranuclear inclusion bodies; they were also present in the walls of blood vessels, the spleen, kidneys and bone-marrow. They gave a positive Feulgen reaction and stained by the ordinary methods.

R. considers that the majority of cases of this condition have the character of a virus infection, while the remainder (differing in morphological appearance) might be of the type of general hyperergic reaction.—F. E. W.

ISAKSSON, A. (1944.) Siderofibrösa mjältknutor hos hund. En histologisk och statistisk studie. [**Siderofibrous nodules in the spleen of dogs.**]—*Skand. VetTidskr.* **34.** 673–684. [English summary.] **1650**

Siderofibrous nodules of varying size up to 1 mm. thick occur in dogs in the capsule and in the walls of the smaller veins of the spleen, where they are tubular and 2–3 cm. long. The tissues in which they occur are as a rule primarily uninjured, although in some cases there has been local hyperplasia of the capsular connective tissue. There was no connection between sex or breed or other pathological findings.—F. E. W.

SCHULTZ, M. P., & ROSE, E. J. (1947.) **"Albumin-bacterioplasma conjugates" with special reference to the etiology of rheumatic fever. A preliminary report.**—*Publ. Hlth Rep., Wash.* **62.** 1009–1022. [Authors' summary copied *verbatim.*] **1651**

The observations described suggest that depending upon quantitative and possibly qualitative variations in the albumin component, human serums and saline solution mixtures of serum proteins differ in their capacity to form toxic substances, provisionally termed "albumin-bacterioplasma conjugates", upon interaction in suspension with sediments of certain strains of group A hemolytic streptococci. Preliminary studies suggest that this property in serum specimens from patients with active rheumatic fever may be characteristically susceptible of enhancement by ultraviolet irradiation. The action of this and other physical agents exerts a considerable influence upon the effectiveness of the constituents of human serum, particularly the albumin fraction, in the formation of toxic conjugates.

A majority of strains of group A hemolytic streptococcus isolated under circumstances suggesting an etiological relationship of the associated bacterial inflammatory process to the development of rheumatic fever in the affected individual appear characteristically adapted to the formation of most potent conjugates of this type.

With recovery, a degree of protective activity is demonstrable in the serum of some rheumatic fever patients such as does not appear to develop during convalescence following other types of febrile illness investigated.

In several species other than man, albumin-bacterioplasma conjugates prepared with the use of homologous and heterologous serum components, when parenterally administered by several routes, induce the development of cardiac lesions resembling those of rheumatic fever.

Of the several tissue fluids and extracts tested, only those obtained from embryonal connective tissue occurring in human umbilical cords proved to be effective agents in the formation of toxic conjugates.

Human beings are reactive to the intramuscular injection of albumin-bacterioplasma conjugates; rheumatic individuals in comparison with others are exceedingly hypersensitive:

Convalescent rheumatic fever patients, differing only quantitatively from controls, react to even comparatively minute doses which exceed individual tolerance levels with pain at the injection site and evidences of systemic disturbance suggestive of extensive tissue damage. One recovering patient with, however, persisting, demonstrable evidence of residual active rheumatic fever responded similarly; in addition, major

manifestations of the disease were transiently incited.

There was no evidence in any individual observed that conjugate injection exceeding the tolerance level provoked any noxious effects other than those incident to the immediate toxicity. With gradually increasing doses the development of tolerance or increased resistance to local and systemic effects was observed in both rheumatic and control subjects.

See also abst. **1733** (medical diseases in tropical and sub-tropical areas).

POISONS AND POISONING

ROSSI, P., & LAMY, E. (1947.) Hyperazotémie chez des veaux à la mamelle. [**Uraemia in sucking calves.**]—*Bull. Acad. vét. Fr.* **20.** 123–127. **1652**

Some calves which were confined in a pen situated within an angle of two walls on which there remained a deposit of potassium nitrate from previous storage, were observed to be licking the walls. They developed acute symptoms of excitability followed by torpor, coma and death. On analysis uric acid was found in the blood. When the calves of this herd were transferred to stalls with wooden walls, no further cases of the complaint were recorded.—R. MARSHALL.

ADUTSKEVICH, V. A., & ZAĬTSEVA, A. G. (1944.) Ob otravlenii domashnikh zhivotnykh i ptits zhëltym fosforom i ego proizvodnymi. [**Phosphorus poisoning in animals and birds.**]—*Veterinariya, Moscow,* No. 8–9. pp. 40–43. **1653**

Information is recorded in this article of phosphorus poisoning in animals. During the two years 1942–43, there were 150 cases, this probably being only a small percentage of the total. The cases occur in areas where military operations had been in progress or where intensive bombing had occurred. The percentage incidence was 50% in swine, 32·5% in ruminants, 13% in horses, 3% in fowls and 1·5% in dogs.

The toxicity of phosphorus compounds is discussed at length, and it is pointed out that the principal agent is yellow phosphorus, and its derivatives, which are soluble in fat, and thus readily absorbed, their toxic activity depending on combination with the oxygen of the tissues, resulting in fat deposition in the parenchymatous organs, and general interference with metabolism.

In diagnosis of phosphorus poisoning it is impossible to rely on the clinical signs and pathological findings. The smell of phosphorus is a convincing sign; chemical tests must be used. The best materials for analysis are vomited material, or the contents of the gastro-intestinal tract.

In horses salivation and vomiting may occur, but in these animals, and in fowls, there is often paralytic-like weakness without definite symptoms. When poisoning is by inhalation of fumes there is a cough, attacks of asthma and oedema of the lungs. Death may occur in 10–15 hours, or the animal may live 2–5 days.

There is inflammation of mucous membranes, fatty degeneration and infiltration of the parenchymatous organs, muscles and endothelium of the blood vessels, and blood extravasation into the subcutaneous tissue, skin and muscles. In pigs 75% have endocardial stippling and petechiae in the stomach mucosa.

Treatment is usually hopeless if delayed, once signs are apparent, but 2% copper sulphate can be given every 5–10 min. to induce vomiting, in pigs, dogs and cats, and as an antidote 0·5% potassium permanganate, 1–3% hydrogen peroxide and 3–5% aqueous solution of soda can be used along with heart stimulants. For local skin burns apply 8% soda solution, copper sulphate or potassium permanganate.

For prevention suspected pastures should be inspected and cleansed. Night inspection may detect the luminosity of phosphorus. Suspicious land may be drenched with chloride of lime, ploughed and again drenched, or utilized for cultivation, and stock excluded for two or three years.—U. F. RICHARDSON.

MEESSEN, H. (1948.) **Chronic carbon dioxide poisoning.**—*Arch. Path.* **45.** 36–40. [Author's summary copied *verbatim.*] **1654**

Dogs, rabbits, guinea pigs and rats exposed repeatedly and over long periods to sublethal doses of atmospheric carbon dioxide presented degenerative changes in the lungs, the liver, the kidney and the brain. These lesions were the result of the increased carbon dioxide tension and were not caused by anoxemia.

SEN GUPTA, P. C. (1947.) **Cerebral lesions in dogs following injections of 4:4′-diamidinostilbene.** [**Correspondence.**]—*Trans. R. Soc. trop. Med. Hyg.* **40.** 508–510. **1655**

Discussing the claim by OASTLER & FIDLER [see *V. B.* **17.** 338] that certain symptoms, and pathological changes were produced in the brain of the dog by injecting fresh solutions of stilbamidine, it is pointed out that they used autoclaved solutions of stilbamidine. It is possible that the autoclaving might induce changes leading to an increased toxicity, as it is known such changes do occur in aqueous solutions of the drug. Such autoclaving is unnecessary, as the contents of the

ampoules of stilbamidine are sterile; sterile distilled water should be used as a solvent. In investigations on the cumulative action of stilbamidine on monkeys and rabbits, no symptoms were encountered resembling those described in dogs, nor were any histological changes of the brain or blood vessels detected. In rabbits given previously heated solutions of the drug there was rapid loss of weight and death caused by damage to the liver and kidneys. In 200 cases of human kala-azar treated at the Calcutta School of Tropical Medicine no symptoms resembling those described by Oastler and Fidler occurred, and in a fair proportion of cases only was there development of diamidino-stilbene neuropathy, this occurring 2–4 months after their discharge from hospital. It also appears doubtful if the type of lesion described in the dog could selectively affect the blood supply of a part of the fifth nerve nucleus.—U. F. R.

GREVAL, S. D. S., & BHADURI, P. N. (1946.) **Poisonous food grain wheat mixed with** *Lolium temulentum.—Indian med. Gaz.* **81.** 294–296. **1656**

A conventional note, containing nothing new on *Lolium temulentum* poisoning.

SARKISOV, A. K., KRASHNINA, E. S., KORNEEV N. E., KOROLEVA, V. P., GERASIMOVA, P. N., & AKULOVA, N. S. (1944.) Vredonosnost' perezimovavshikh na polyakh zlakov. **[Toxicity of wintered graminaceous plants on pastures.]**—*Veterinariya, Moscow.* No. 11–12. pp. 39–42. **1657**

The authors fed horses, pigs and cattle on "wintered graminaceous plants" on which the following fungi were present:—*Fusarium sporotrichioides*, *Aspergillus calyptratus*, *Hymenopsis* and *Phoma* species. While horses given this fodder were seriously affected, pigs were less so and cattle were unaffected. In the case of the horses there was ulceration of the lips, gums and mouth, salivation and a diptheritic deposit on the root and edges of the tongue. The clinical signs could easily be interpreted as *Stachybotrys* infection. Injection of *Fusarium sporotrichioides* toxin produced illness in horses similar to that resulting from the ingestion of the "wintered graminaceous plants." The authors concluded that the toxicity of the fodder was due to that toxin and to a lesser extent to toxins from other fungi. Toxicity produced in grain by fungi was observed in other experiments showing the connexion between illness of stock and *Stachybotrys alternans*, in one case, and *Claviceps papsalum*, in another, in the fodder.—S. W. SALTER.

See abst. **1713** (arsenic).

NILSSON, S. A. (1945.) Genom nefrotoxin experimentellt framställda njurskador hos hund och kliniska iakttagelser vid desamma. **[Experimental kidney damage in dogs caused by nephrotoxin.]**—*Skand. VetTidskr.* **35.** 321–355. [English summary.] **1658**

Fourteen dogs were treated with nephrotoxin from rabbits in an attempt to induce kidney damage. In seven of the dogs kidney disorders resulted. These seven cases were sub-divided as follows: those with acute glomerulonephritis with disturbance of renal function; those with acute glomerulonephritis without disturbance of renal function; and those in which the clinical findings were mainly albuminuria.

In cases in the first two groups there was pronounced albuminuria, haematuria, cylindruria and celluria. In the first group oliguria was also noted, with subsequent polyguria and hyposthenuria, and in kidney function tests there were marked deviations from the normal. Only in the first group were there morphological changes in the glomeruli on section. In the other groups there were either interstitial or tubular lesions or no apparent changes.—F. E. W.

PHARMACOLOGY AND THERAPEUTICS

GADDUM, J. H. (1946.) **The use of isotopes in biology.**—*Edinb. med. J.* **53.** 284–295. **1659**

This paper was given as a lecture to post-graduate students. G. describes the structure of an atom and points out that its chemical properties depend only upon the number of electrons which are attached outside the nucleus. When the atom is electrically neutral the number of electrons must be equal to the number of protons in the nucleus so that chemical properties are then controlled by the number of protons. The atomic number of an element is equal to the number of protons in its nucleus. Two elements are isotopic with one another when they have the same atomic number and the same chemical properties but different atomic weights. All elements except hydrogen have neutrons in their nucleus. All stable nuclei, except one, have at least as many neutrons as protons. The simplest isotope is heavy hydrogen deuterium, with one neutron and one proton and it has the same chemical properties as ordinary hydrogen but is about double the weight. Several hundred new isotopes, which are made by bombarding ordinary atoms with small particles travelling at high velocities, have been manufactured in the last few years. The production of particles travelling with sufficient velocity to produce definite changes in the nucleus is difficult.

When the particles contain an electric charge they can be accelerated by exposing them to large voltages. The particles can be made to travel round in circles in a cyclotron and can be accelerated by exposing them to a series of voltage changes so that their velocity is gradually increased to the required value. The particles used in a cyclotron may be protons or deuterons or alpha particles. Each alpha particle consists of two protons and two neutrons. The other most important form of missile is the neutron which has no charge and the penetration of the nucleus is comparatively easy. Several things may happen when a small particle hits the nucleus of an atom and the upshot may be the production of new isotopes which may either be stable or unstable. The stable ones occur under natural conditions; the unstable ones undergo spontaneous changes which eventually lead to the formation of stable forms of the atoms. Various radiations, α, β and γ rays are thrown out in the process so that these atoms are artificially radio-active. Isotopes have been used both in chemistry and biology. The artificial isotope has exactly the same chemical properties as the natural isotope. Once the two have been mixed together they cannot be separated by ordinary chemical means and living organisms are unable to distinguish between them. Isotopes can only be separated again by physical apparatus such as a mass spectrograph. The presence of the unusual isotope then serves as a label for the particular atoms which have been used experimentally. If isotopes are radio-active the presence of radio activity serves as a label in the same way. A great deal of work has been done with such labelled elements. They are administered to animals or plants and then recovered from different organs or from different chemical fractions of the living organism so as to see what chemical changes those particular atoms have undergone in the meantime. Although there are numerous physiological applications of isotopes such as the distinguishing of atoms used by experimenters from those of the same kind already present in the body, the radio-active isotopes are of particular interest in pharmacology as they can be estimated in exceedingly low concentrations and should also be of value in the study of the fundamental mechanisms of chemotherapy.—C. Horton Smith.

Johnson, S. D., & Roberts, S. J. (1947.) **Combination of sulfonamide compounds and penicillin for the treatment of mastitis by infusion: a preliminary report.**—*Cornell. Vet.* **37.** 144–155. **1660**

This is a clinical article giving a preliminary report of the results obtained in treating various forms of mastitis by combinations of various sulphonamide drugs with penicillin. Details are given of clinical and laboratory examinations before and after treatment. Twenty quarters with various infections were treated with 60 ml. of sulphanilamide in oil (35%) plus 50,000 units of penicillin at each infusion at 24-hour intervals. The results confirmed past experience that a higher efficiency from fewer infusions of the drug may be obtained by treating dry rather than lactating quarters. Sulphamethazine was used in the form of the sodium salt (5% in distilled water) and had no irritating effects; the average dosage was 50 ml. combined with 25,000–50,000 units of penicillin, either as a single infusion or infused two or more times at 24-hour intervals. Lactating quarters were stripped out after 12–15 hours but dry quarters were not stripped out after the final infusion. The general conclusion reached was that the combined treatment with either of the sulphonamides and penicillin produced better clinical and bacteriological results with fewer infusions than with either one of the drugs administered separately.—Alan A. Wilson.

Edmonds, E. V. (1947.) **Sulfathalidine in swine enteritis. Further observations regarding the management of enteritis among feeder pigs with sulfathalidine.**—*Vet. Med.* **42.** 170–173. **1661**

Enteritis developing in garbage-fed feeder pigs, often 7–10 days after vaccination against swine fever, is a serious problem in many parts of California. In a group of 869 affected feeder pigs given 2–4 g. sulphathalidine per day in the food for 2–4 days 92·5% recovered. In 1,022 pigs given one or two doses of four g. sulphathalidine on the day of vaccination against swine fever or a day before 5·7% died from enteritis. Control groups could not be maintained, but the authors consider that if this drug treatment had not been given the mortality would have been much higher.
—R. Scarisbrick.

Schalm, O. W., & Casselberry, N. H. (1946.) **Treatment of *Streptococcus agalactiae* infections with intramammary infusions of penicillin.**—*J. Amer. vet. med. Ass.* **109.** 470–477. **1662**

Tests were made on seven herds having a total of 1,650 mature cows. In all herds cows with *Str. agalactiae* infection were milked last; in four of the herds the teats were dipped in a solution containing 250 p.p.m. available chlorine after milking, while in two the milking machine cups were also dipped in the solution. After treatments were started cows which ceased to shed *Str. agalactiae* in the milk were placed at the head of the group in order of milking. Tests were made on composite milk samples and at certain stages on quarter samples from infected cows. The Hotis test was used, microscopic examination of

smears from the incubated Hotis test samples and identification of cultures. After treatment a quarter was not considered cured until the secretion had remained free of *Str. agalactiae* for a period of at least eight weeks.

The rate of absorption varied; in the absence of active milk secretion satisfactory levels of penicillin can be expected in most quarters 24 hours after a single injection of 100,000 Oxford units, given in four doses of 25,000 units every 24 hours or 20,000 units every 12 hours. For quarters giving over 10 lb. of milk per day a total of 200,000 units is advisable, given in four doses of 50,000 units at intervals of 24 hours. The volume of the vehicle should be sufficient to distribute the penicillin over as large a part of the gland cistern as possible; if the volume is too small some hours may elapse before sufficient milk is secreted to enable the penicillin to come in contact with all the affected tissue. A volume of 50 ml. seems to be adequate for dry and average-sized lactating quarters and 100 ml. for very large or swollen quarters. Distilled water, physiological saline, 0·4% pectin, 10% glucose and mineral oil all seemed of equal value as diluents. Both the sodium and calcium salts of penicillin were used and these were equally effective.

261 quarters infected with *Str. agalactiae* were treated. The volume of milk secreted by a quarter has a greater influence on the efficacy of penicillin infusions than has the extent of tissue damage. Single infusions of 100,000 units into dry or lactating quarters resulted in a much lower percentage of cures than four doses of 25,000 units each, administered every twenty-four hours. Twice a day milking should be continued during the treatment period. In order to prolong the stay of penicillin in the quarter it is desirable to omit one milking after the last infusion of the series.—ALAN A. WILSON.

JOSHUA, J. O., & FREAK, M. J. (1947.) **Penicillin in Leptospira canicola infection in the dog.**—*Vet. Rec.* **59.** 595–596. **1663**

The authors suggest that penicillin is specific for *L. canicola* infection in the dog and that it can be used to differentiate this infection from *L. icterohaemorrhagiae* infection.

Six case histories in five dogs and one bitch are quoted with details of symptoms, treatment and agglutination titres. One death occurred in which there was marked pneumonia at P.M. examination. The other cases made successful recoveries.—J. D. RANKIN.

MURPHY, J. M. (1947.) **Treatment of a case of pyelo-nephritis with penicillin.**—*Irish Vet. J.* **1.** 93. **1664**

A cow became ill and passed blood in the urine; *Corynebact. renale* was isolated from the urine. 50,000 units of penicillin were administered on each of two consecutive days. The cow made an uneventful recovery.—J. D. RANKIN.

MATHEWS, A. G., & SHELTON, M. L. (1947.) **A streptomycin sensitivity test.**—*Med. J. Aust.* September 27th. 387–390. **1665**

A method of determining the relative sensitivity of a bacterium to streptomycin is described in detail. The method employs a strain of *Staphylococcus aureus* as a reference organism, and a new simple medium. Attention is drawn to the influence of pH, Eh, size of inoculum, to the existence of a small proportion of very resistant cells in strains of some organisms and to the effect of body fluids.—D. F. STEWART.

VOGELSANG, T. M., & BÖE, J. (1946.) **Sensitivity of salmonella and shigella to streptomycin in vitro.**—*Acta path. microbiol. scand.* **23.** 457–463. [In English, authors' summary copied *verbatim.*] **1666**

The sensitivity of 32 *Salmonella* laboratory strains to streptomycin *in vitro* was investigated. Among them were several of the more common types. Eight different *Shigella* types were also examined.

On agar, most of the strains still showed feeble growth at a concentration of 50 units per ml. of medium, whereas the inhibition of growth was somewhat more marked when the same strains were examined in broth. In some of the broth tubes which continued to be clear after incubation for 24 hours, further incubation resulted in growth. This suggests that the action of streptomycin on these bacteria is more of a bacteriostatic than of a bactericidal character.

VENNESLAND, K., EBERT, R. H., & BLOCH, R. G. (1947.) **The demonstration of naturally-occurring streptomycin-resistant variants in the human strain of tubercle bacillus H-37RV.**—*Science.* **106.** 476–477. **1667**

Variants, highly resistant to streptomycin, have been demonstrated in cultures of shigella, strains of *Staph. albus*, *Staph. aureus*, *Proteus vulgaris*, *Bact. coli* and *H. influenzae*. The authors report the development of resistance to streptomycin in the human type strain H.37 Rv. of tubercle bacillus using Dubos' liquid medium.

—M. WOODBINE.

WOODBINE, M. (1947.) **Chemotherapy of *Erysipelothrix rhusiopathiae* infections in mice with streptomycin.**—*Vet. J.* **103.** 149–152. **1668**

W. tested seven strains of *E. rhusiopathiae* against sulphapyrazine, benzylamine-4-sulphonamide, penicillin and streptomycin *in vitro* and *in vivo*, mice being used as the test animals in the latter tests.

E. rhusiopathiae was resistant *in vitro* to sulphapyrazine, but susceptible to the other three agents, penicillin being weight for weight approximately 100 times as active as streptomycin.

500 units of penicillin and 1,000 μg. base of streptomycin hydrochloride prepared by surface culture and recently assayed at 360 μg. of base per mg. were required to protect when given intraperitoneally twice daily for ten days and once daily for the following five days. In contradistinction to the results obtained *in vitro* there was a synergic action between penicillin and streptomycin *in vivo*. While the author found that the organism was sensitive to penicillin he was of the opinion that neither it nor streptomycin was likely to be effective in infection in pigs (see also WOODBINE *V. B.* **16.** 370).—J. A. J. VENN.

PURI, I. M., & PAL, R. (1947.) **Studies on some insecticides against anopheline adults and larvae. I. Preliminary experiments at Delhi with DDT.**—*Indian J. Malar.* **1.** 133–158. **1669**

PURI, I. M., & KRISHNASWAMI, A. K. (1947.) **Studies on some insecticides against anopheline adults and larvae. II. DDT as residual and space spray and as larvicide.**—*Ibid.* 159–181. **1670**

PURI, I. M., & BHATIA, M. L. (1947.) **Studies on some insecticides against anopheline adults and larvae. III. Experiment with DDT as a residual spray in some villages in Baluchistan.** —*Ibid.* 183–191. **1671**

PURI, I. M., & KRISHNASWAMI, A. K. (1947.) **Studies on some insecticides against anopheline adults and larvae. IV. Experiments with DDT and 666 as residual spray in some villages around Delhi in 1946.**—*Ibid.* 193–209. **1672**

PURI, I. M. (1947.] **The practical application of DDT for malaria control in rural and urban areas in India.**—*Ibid.* 211–220. **1673**

I. Of synthetic insecticides, D.D.T. and 666 are the only two which compare favourably with pyrethrum. The authors used solutions, emulsions and suspensions of D.D.T. They found that solutions of D.D.T. in used engine oil and kerosene were very effective against mosquito larvae, using 4–6 ml. 5% solution (200–300 mg.) per 10 sq. yd. of water surface. Emulsions of D.D.T. in turpentine were more effective than oil solutions as larvicides, at 300 mg. per 10 sq. yd. D.D.T. in solution or emulsion was not ovicidal and oviposition was not inhibited 2–3 days after application. Application by stirrup pump with a special nozzle, at the rate of 200 mg. per sq. ft., either as solution or emulsion was effective inside mud huts, against mosquitoes.

II. As a larvicide and insecticide for mosquitoes, D.D.T. was found to be effective at the rate of 200 mg. per 10 sq. yd. in fields and slow-running streams. As an indoor residual spray, one quart of a 5% solution or emulsion per 1,000 sq. ft. of surface was effective for nearly two months, and as an outdoor spray, 1–2 gal. of a 5% solution or emulsion per acre applied for 50 yds. around buildings was effective for 3–13 days.

III. Kerosene solutions of D.D.T. used as an indoor spray at 50 mg. per sq. ft. were effective for nearly ten weeks.

IV. Applications were made of D.D.T. in solution, emulsion or suspension at the rate of 25 or 50 mg. D.D.T. per sq. ft. and gave a strong toxic effect on anophelines for about eight weeks at the 50 mg. rate.

Solutions of 1% gammexane had little residual effect.

V. As an indoor spray a suspension of 50 mg. D.D.T. per sq. ft. reduced the number of mosquitoes for 10–12 weeks and for a second application 25 mg. D.D.T. per sq. ft. was used. —F. C. MINETT.

YAKOVLEV, KOMAROV & TARKHOVA. (1944.) Formalin pri piroplazmoze loshadeĭ. **[Formalin in the treatment of equine piroplasmosis.]**—*Veterinariya, Moscow.* No. 4. pp. 40–41. **1674**

Experimenting on the value of subcutaneous injections of formalin in the treatment of equine piroplasmosis [*Babesia caballi* ?], a dose of 200 ml. of 4% formol saline was adopted. Used prophylactically 1·9% of horses developed clinically apparent infection, and 0·3% died, approximately the same result as that given by trypanblue. Used curatively on 452 horses there was a mortality of 23·6%. About 10% of horses developed a sharp general reaction with excitement, acceleration of respiration and profuse lachrymation. Locally a swelling was produced, particularly if injection was rapid, and this might resolve or burst. With large doses necrosis might result, requiring prolonged surgical treatment.

It is concluded that in the absence of a more convenient drug, such as trypanblue, formalin can be used for the treatment of equine piroplasmosis. [No real evidence is given that formalin had any specific action on animals with piroplasmosis.] —U. F. RICHARDSON.

BIZOT, J., & CLOUET, M. (1946.) Traitement de l'arthrite des poulains par le thiazomide. **[Sulphathiazole in the treatment of joint-ill in foals.]**—*Rev. Méd. vét., Lyon et Toulouse.* **97.** 100–108. **1675**

The authors treated 36 cases of joint-ill in foals averaging 40 kg. in weight with soluble sulphathiazole, 20 ml. of a 20% solution of which was injected intramuscularly in the morning followed by four to five 1 g. tablets of sulphathiazole administered orally every ten hours for 4–5 days.

Seven of the cases are described in detail. Of the total number of cases, one was of the acute septicaemic, ten of the sub-acute septicaemic and 25 of the articular form. The acute case died; three of the sub-acute cases died, and seven were cured and of the articular cases eight died, 12 were cured and five became chronic.

The authors conclude that the treatment reduced the mortality coefficient and that in the sub-acute septicaemic and articular forms the treatment was useful.—F. E. W.

TRAVIS, B. V. (1947.) **New insect repellents.**—*Yearb. U.S. Dep. Agric. 1943–1947.* pp. 628–631. **1676**

During the war, large numbers of synthetic chemicals were tested for insect and mite repellency, with a view to replacing the old mixtures such as citronella and pennyroyal since war conditions in some parts of the world had proved the latter to be inadequate. Some of the promising new repellents found are mentioned and reference is made to the limitations in their uses. No repellent so far developed is effective against all pest insects or mites; for protection against a particular insect or insects the specific repellent or repellent mixture must be chosen.—L. DAVIES.

PAVAN, G., & RENATO, T. (1943.) Potere battericida dei disinfettanti e dissociazione dei germi. [**Bactericidal value of disinfectants and dissociation of bacteria.**]—*G. Batt. Immun.* **30.** 537–549. [English, French & German summaries.] **1677**

A conventional article.—K. J. SINCLAIR.

STAGE, H. H., & IRONS, F. (1947.) **Air war against pests.**—*Yearb. U.S. Dep. Agric., 1943–1947.* pp. 835–838. **1678**

The development in the U.S.A. of insecticide application from the air, is outlined. The main features of successful apparatus installed in aeroplanes for the distribution of sprays and dusts are briefly given, and particular attention is given to methods, developed since 1943, of spraying concentrated D.D.T. from the air.—L. DAVIES.

WATERHOUSE, D. F., & FULLER, M. E. (1946.) **The use of borax for the prevention of fly breeding in trap baits.**—*J. Coun. sci. industr. Res. Aust.* **19.** 321–329. **1679**

A number of flies develop in untreated baits in blowfly traps. Borax sprinkled over the surface of the bait inhibited larval development but reduced the attractiveness of the bait to adult flies, and it was concluded that the addition of borax to baits was not warranted.—H. McL. GORDON.

PROVERBS, M. D., & MORRISON, F. O. (1947.) **The relative insecticidal activities of DDT and related organic molecules.**—*Canad. J. Res.* Sect. D. **25.** 12–44. [Authors' abstr. slightly amended.] **1680**

Impregnated filter paper, and coated glass substrata, as well as direct spraying techniques were employed to test the relative toxicity of several organic molecules related to DDT, as contact insecticides against adult *Drosophila melanogaster.* Anaesthetizing the flies for convenience of handling did not affect observed mortality. In general both impregnated paper and coated glass (vial) techniques gave reproducible results. The former resulted in an unexplained drop in mortality above a certain dosage level; the latter gave somewhat more uniform results. Direct spraying was superior when the chemical had a fumigant effect also.

γ, 1, 2, 3, 4, 5, 6-Hexachlorocyclohexane and the difluoro analogue of DDT alone out of 18 chemicals tested, exceeded DDT in effectiveness. The γ isomer of 666 exhibited a strong fumigant but also a long residual effect while the difluoro analogue lost toxicity rapidly.

Removal of one or both phenyl chlorine atoms from the DDT molecule, or alteration of their p-p positions, or their substitution by any radical other than F, interference with the trihalogen group of DDT, or the introduction of a double bond into the molecule, all seriously affected the insecticidal action of the DDT. Arranged from the most to the least toxic, the halogen analogues of DDT have the following order: fluorine, chlorine, bromine, iodine.

GILMOUR, D. (1946.) **The toxicity to houseflies of paints containing DDT.**—*J. coun. sci. industr. Res. Aust.* **19.** 225–232. **1681**

A number of different types of paints containing D.D.T. were tested against houseflies. The most effective were a glossy enamel containing 20% D.D.T., and a flat oil paint containing 3–5% D.D.T. Effectiveness depended on the degree to which D.D.T. crystallized in the paint film.—H. McL. GORDON.

NICOL, G. (1947.) **Control of the sheep ked. Field trial with D.D.T.**—*J. Dep. agric. Vict.* **45.** 211–212. **1682**

A suspension containing 0·2% D.D.T. was very effective in destroying adult keds and there was sufficient residual effect to destroy keds emerging from pupae. Sheep which had been shorn one week previously and unshorn lambs were used in the trial.—H. McL. GORDON.

SOSNINA, E. F. (1946.) Ispuitanie nekotoruikh dezosredstu dlya borbui s kleshchami. [**Test of certain disinfectants for the control of the tick, *Ornithodorus papillipes* Bir.**]—*Izv. tadzhik. Fil. Akad. Nauk SSSR.* No. 6. pp. 92–100. [In Russian, abst. in *Rev. appl. Ent.* Ser. B.

35. 76–77. (1947), slightly amended.] **1683**

In the first of the experiments described, which were carried out in Tadzhikistan in 1943, examples of *Ornithodoros tholozani* (*papillipes*) collected in animal quarters were placed in glass jars and sprayed or dusted with substances under test. Spraying with a pinene fraction of juniper oil, medium light tar oil and anabasine sulphate killed all the ticks in five minutes, while kerosene and a 10 per cent. solution of K soap [a soap containing 50 per cent. dixanthogen] both did so in 15 minutes. Of the powders, desinsectalin gave a complete kill in rather more than 24 hours, whereas SK dust and pyrethrum powder killed only 80 and 36·7 per cent., respectively, in 48 hours.

When filter papers were impregnated with the liquids under test and placed round the inside of the jars at about an inch from the bottom or the dry substances were suspended in the jars in small muslin bags of double thickness so that there was no direct contact, kerosene, tar oil and the pinene fraction of juniper oil gave a complete kill in 2, 8 and 48 hours, respectively, and desinsectalin, SK dust, K soap, SK liquid, anabasine sulphate and pyrethrum powder 95, 73·3, 70, 60, 20 and 3·3 per cent., respectively, in 48 hours.

In tests of repellent action, powders or strips of fabric impregnated with liquids were distributed round flat celluloid rings 10 ins. in diameter nailed to boards covered with clay, and ticks were liberated in the centre of each ring. The dusts tested were desinsectalin, SK and pyrethrum powder, and all were ineffective in preventing the ticks from crossing the barrier; the percentages that crossed impregnated fabric within an hour averaged 50 for tar oil, 63·3 for anabasine sulphate, 73·3 for SK fluid, 80 for kerosene and 83·4 for the pinene fraction of juniper oil, and nearly all the ticks that remained inside the rings were dead.

To test the probable effect of liquids on ticks in a clay wall, small muslin bags containing partly engorged nymphs were inserted into holes in clay disks about 3 ins. thick and the holes stopped with wooden plugs. The disks were then impregnated with the liquids under test and placed in holes in the ground 10 ins. deep where they were shaded with twigs and dry grass. Different lots of ticks were examined on the six succeeding days and the results showed that γ-pinene of juniper oil killed all the ticks in two days, and kerosene and a 25 per cent. emulsion of tar oil nearly all in six days; 10 per cent. SK fluid or K soap in water and a 25 per cent. solution of anabasine sulphate had no effect. These disks were also used to test the effect on ticks in walls of incorporating toxicants in whitewash or in clay used to stop cracks, but no success was obtained.

In experiments on the treatment of a vertical surface, the ticks were placed in muslin bags in holes about 1¾ ins. and 2 ins. behind the front surfaces of blocks of clay and these surfaces brushed several times in two hours with γ-pinene of juniper oil, kerosene or a 25 per cent. emulsion of tar oil. The blocks were exposed to rainy weather in a draughty building with broken windows, and different lots of ticks examined daily. After six days, most of the ticks in the holes nearer to the treated surfaces were dead and the survivors moved only with difficulty, but mortality in the holes further from the surface was slight.

Roberts, F. H. S. (1947.) **The efficiency of sodium fluoride as an anthelmintic for swine.** —*Aust. vet. J.* **23.** 82–90. **1684**

Commercial sodium fluoride (73% NaF) administered in the food for one day at rates of 0·1–0·25 g. per lb. body weight was highly efficient in individual tests against *Ascaris lumbricoides*, moderately efficient against *Ascarops strongylina*, *Physocephalus sexalatus* and *Oesophagostomum* spp., and ineffective against *Trichuris trichiura* and *Macracanthorhynchus hirudinaceus*. In group tests where a number of pigs were fed together efficiency was generally lower. The pig is very tolerant to the drug.

The drug was mixed with an amount of dry food calculated on the basis of 1 lb. for every 25 lb. live weight. Tables are given to show dose rates for pigs of various weights. Numerous experiments are described in which the efficiency of various dose rates were tested and the possibilities of toxic effects examined.—H. McL. G.

Zarnowski, E. (1946.) Przyczynek do zwalczania robaczycy jelitowej koni spowodowanej przez nicienie z rodziny Strongylidae i glisty-Parascaris equorum. [**The control of strongylosis and ascariasis in the horse.**]—*Med. Wet.* **2.** 85–88. [Abst. from French summary.] **1685**

Z. describes the use of a mixture of carbon disulphide (10–15 ml.) and carbon tetrachloride (20–25 ml.) in liquid paraffin (30–40 ml.), to control strongylosis and ascariasis simultaneously. —J. H.

Delak, M. (1944.) Osjetljivost askarisa prema kloriranim ugljikovodicima. [**Susceptibility of ascarids to chlorinated hydrocarbons.**]—*Vet. Arhiv.* **14.** 205–219. [Abst. from German summary.] **1686**

Pure tetrachlormethane (CCl_4) and 10% tetrachlorethylene (C_2Cl_4) respectively were tested on 594 ascarids (*A. lumbricoides* and *Parascaris equorum*), some on free worms in Bunge's solution and others on worms attached to a recording kymograph. Parallel tests were run with concentrations varying from 0·001 to 100%.

Both species were susceptible to CCl_4 and C_2Cl_4 in very low concentration (0·001%), susceptibility increasing with concentration in both cases. Pure CCl_4 was lethal to both ascarids in 15–23 hr. and C_2Cl_4 at the same concentration in 15–25 hr.—K. J. SINCLAIR.

TAYLOR, I. W. (1947.) **Antihistamines and their use in small animal practice.**—*N. Amer. Vet.* **28.** 362–365. **1687**

Histamine is liberated in anaphylactic shock, and, if injected, produces similar shock symptoms. It is thought that a histamine-like substance is liberated during skin injury and also in the course of allergic reactions, manifested by swelling, the skin reactions being similar to those from scratching, freezing or burning.

The antihistamines may be either certain amino acids which have very slight *in vivo* activity, or more active substances such as pyribenzamine and benadryl. Pyribenzamine if injected previously will protect a g. pig given a lethal dose of 0·5–0·6 mg. of histamine per kg., and 3·5 mg. per kg. protects a dog against artificially induced shock.

The mechanism of the action of antihistamines is unknown. They do not immunize patients, or protect them from the effect of allergic reaction for any extensive period. It is considered that in true cases of allergic dermatitis these drugs offer the most beneficial type of medication.

—J. O. L. KING.

HÉRAULT, M. (1947.) Les infections traumatiques et de propidon. [**Treatment of traumatic diseases with propidon.**]—*Cah. Méd. vét.* **16.** 37–40. **1688**

H. discusses the treatment of severe injuries in horses, using "propidon", [composition not stated]. The drug was administered by intramuscular injection in doses of 4–8 ml. All the animals recovered after a short course of treatment.

—J. A. G.

JOHNS, C. K., & PRITCHARD, H. V. (1946.) **Quaternary ammonium compounds as preservatives for milk.**—*Canad. J. publ. Hlth.* **37.** 500–504. **1689**

Four of the quaternary ammonium compounds namely, "hyamine 1622," "roccal," "R-2-L" and "emulsept" [composition not given] were found to be less effective than formalin as antiseptics when added to milk.—J. W. PULLIN.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

WEISS, E. (1947.) **Psychosomatic aspects of allergic disorders.**—*Bull. N.Y. Acad. Med.* **23.** 604–630. **1690**

W. suggests a relationship between neurotic and allergic disorders in man and considers that the study of an allergic problem requires psychological as well as physiological technique.—M. C.

See also abst. **1731** (medical biochemistry—a text-book).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

BAKALOR, S. (1947.) **Investigations on the composition of South African milk. The milk supplied to condenseries.**—*Fmg S. Afr.* **22.** 807–819. **1691**

There are seven registered condensories in the Union and these, with one exception, are all situated in the summer rainfall districts.

It has been noticeable that in two areas there has been a steady decline in the solids content of the milk during the past few years though there has been some amelioration lately. This fall has been more apparent in the solids not fat (S.N.F.) than in the fat, and while no batch of milk has been below the standard for fat, 45·6% fell below the standard of 8·5% of S.N.F. The reason for this fall is discussed and the changes in the breeds of cattle, feeding and possible climatic differences are considered. The original cattle in many herds were of the unimproved indigenous breeds which produced little milk, but milk rich in solids. Now, these have been largely replaced by imported breeds which produce more milk but milk poorer in solids.

Improvement of these conditions was given consideration. In this connection it must be borne in mind that the condenseries are primarily interested in the solids content of milk. The payment for milk on a quality rather than on a quantity basis would appear to be the immediate remedy. In the condensing process about 60% of the water content must be removed and thus, milk high in solid content is much to be preferred. On the other hand, the fat content must not be too high in relation to the S.N.F.

Four statistical tables and three graphs illustrate the report.—D. S. RABAGLIATI.

PULLINGER, E. J. (Undated.) **The provision of a safe and satisfactory milk supply on a national basis with special reference to South African conditions.**—*Thesis, Pretoria.* pp. 185. [Mimeographed.] **1692**

The report is a survey of our present knowledge and of the practice of milk production, especially as it applies to South Africa, leading up to a strong plea for the formation of a Public Utility Corporation or a Joint Producers' & Consumers'

Co-operative Society. P. discusses methods of dealing with and ultimately eliminating, such diseases as bovine TB., contagious abortion, mastitis and salmonellosis as they affect the cow, and tuberculosis, undulant fever, septic sore throat, staphylococcal and salmonella food poisoning, diphtheria and scarlet fever as they affect man. Under the heading of " Man as a reservoir and spreader of infection ", he discusses typhoid and para-typhoid fevers, bacillary dysentery, scarlet fever and septic sore throat and diphtheria.

The author visualizes four stages in eliminating disease, which would naturally be spread over a considerable number of years. The first stage in establishing the scheme would be to survey the incidence of these diseases throughout the country. This would involve a systematic application of the tuberculin test in all districts with the branding of reactors. Simultaneously, with the tuberculin test would be carried out agglutination tests of all herds, and using the same blood samples, some form of serological test for salmonella infection would also be done. Co-incident with beginning to plan the foregoing survey, it would be necessary for the state, or for some chartered corporation authorized by the state, to acquire large cattle ranches, the general idea being to run upon such ranches, a generally infected herd and to breed from this herd disease-free calves. The second stage would begin as soon as possible after a pilot tuberculin test had been completed in a district, reactors being taken over by the state on the terms :– " open cases of tuberculosis without compensation ; " closed " reactors unfit for breeding on a three quarters salvage valuation and reactors suitable for breeding on a three quarters market value. The building up of state-owned herds and the breeding of disease-free calves would be the third stage. All calves would be removed from their dams at birth and would be hand-fed on pasteurized milk prepared on the farm. The fourth stage represents the eradication and control scheme getting into full stride and should be reached in 4–5 years. By this time a constant supply of healthy heifers would be available from the state farms and it would then be possible to remove all the branded reactors left on the farms. From this stage also, routine testing would proceed automatically, new reactors to tuberculosis being replaced, salmonellosis reactors being replaced and a more severe interpretation placed on what constitutes cows uneconomical from the mastitis point of view. Since all replacements would be with cattle from state farms immunized against contagious abortion, it would only be necessary to introduce compulsory vaccination to put this problem on a sound agricultural footing.

Great stress is laid upon the difference between " clean " and disease-free or " safe " milk and the author is a great exponent of the benefits of pasteurization which he deals with at great length and in considerable detail.

The functions of a Public Utility Corporation would be to purchase all milk, cream and farm manufactured milk products produced for sale. The benefits of such a corporation are considered and also the objections raised, the most serious coming from the Public Health Authorities who feel that their prerogatives would be interfered with. The author feels that in the proposed Milk Utility Corporation the M.O.H. would be in an immeasurably stronger position, because in his own area he would be, jointly with the senior Veterinary Officer, the Chief Executive Officer of the area.—D. S. Rabagliati.

Fed'ko, S. I. (1944.) Veterinarnaya rabota v molsovkhozakh sistemy NKSKh SSSR. **[Veterinary work on State dairy farms.]**—*Veterinariya, Moscow.* No. 8–9. pp. 4–5. **1693**

In this article the writer emphasizes the importance of timely prophylactic measures in the reduction of the incidence of parasitic and infectious diseases of cattle, and in particular of salmonella infections and dictyocaulus infestation of calves. In addition to medical prophylaxis, he recommends the training of state dairy farm personnel in sanitary measures.—I. W. Jennings.

I. Perreau, E. H. (1941.) Restrictions à la vente de bestiaux en foire. **[Restrictions of the sale of cattle at fairs.]**—*Rev. Méd. vét., Lyon et Toulouse.* **92.** 32–40. **1694**

II. Perreau, E. H. (1941.) Restrictions à la vente et à l'abatage du bétail. **[Restrictions of the sale and slaughter of cattle.]**—*Ibid.* **92.** 118–123. **1695**

I. During the recent war one of the chief causes of the high cost of living was the number of speculators and would-be dealers of cattle. To prevent this and to curtail the number of those buying and selling cattle, the Government brought out a decree dated February 29th, 1940, limiting the class of buyers and the conditions of sale for fairs and markets.

The restrictions applied to the sale of cattle on the hoof ; to the people allowed to buy cattle on the one hand and to the places of sale on the other. These restrictions applied not only to the usual butchers' animals (cattle, calves and sheep) but also to horses, mules and donkeys, goats and kids and to pigs, sows and piglets.

The permission granted to persons applied to three classes :– first, proprietors, farmers, cultivators and their families working with them in agriculture, these persons had to buy only what

they actually required for their trade and work and had to justify the quality of their purchases. The second class were dealers who had to be genuine cattle dealers and who paid a fee to their associations and the third class were stewards or clerks who were skilled in sales and who acted for *bona-fide* dealers.

Details are given as to the restrictions on the sales and a list of fines and penalties for transgressors of the decree are appended.

II. Restrictions were placed on the sale of cattle for slaughter, by decree dated February 29th, 1940, to preserve the cattle population for the increased demands of the army. This decree forbade the exposure for sale, or the sale for slaughter, of three classes of animals :– (1), cows in-calf for five months or more or cows in which the foetus could be felt by palpation, or cows which appeared to be five months pregnant. Sale was permissible when less than five months pregnant, provided that pregnancy could not be ascertained by palpation ; (2), calves less than five weeks old. Only the sale for slaughter for meat was prohibited, but not necessarily for other purposes, notably it was not forbidden to slaughter calves for their skins for furriers, as the skins of young animals were greatly valued for this purpose. It was thought that the numbers slaughtered for this purpose would be negligible and could be disregarded, and (3), bovine animals over two months of age, not having at least two incisor teeth replaced.

Special exceptions to the law were permitted such as for emergency slaughter.

A list of fines and penalties for infringement of the law are given.—D. S. R.

CRAWFORD, F. W. (1946.) **The U.S. Army Veterinary Service in Australia.**—*Fed. Vet.* **3.** No. 6. 1 & 2–5. **1696**

The Veterinary Service was mainly concerned with the organization to manufacture and procure foodstuffs in Australia from local supplies. The animal products included all varieties of fresh meat, beef, lamb, mutton and pork, fresh fish, butter, milk and eggs, as well as the development of a canned food industry. Australia had only produced corned beef and corned mutton before the war but American demands for more varieties were well met. A great deal of development in the introduction of American methods became necessary to provide the needs of the U.S. Armed Forces ration scale both in quantity and variety.

Australia's pork production is limited and confined to bacon type breeds. Facilities for curing were limited and lack of suitable woods for smoking did not permit of a satisfactory dark smoke colour in ham and bacon. Apparently Australian preserving salt contains less sodium chloride than American.

Beef cattle are grass fattened only, no dry feeding for finishing beef is practised. Hereford types predominate for beef production although there are herds of Shorthorns. Grade cattle predominate.

Milk and butter in Australia were of high quality. The milk consistently averaged 4% butter fat. It was noticeable there were no Holstein dairy herds. Jersey, Guernsey and Ayrshire breeds make up the majority of dairy herds.

TB. eradication had not been attempted in Australia. A few individual dairy herds had been tested and classified TB. free. The U.S. Army authorities tried to introduce mass tuberculin testing but the Commonwealth and State Governments " did not make the testing mandatory and provided no indemnities for removal of reactors ". Statistics showed less than 2% of reactors to TB. infection in the average dairy herds but brucellosis amounted to 70%.

All milk used by the American Forces had to be efficiently pasteurized as it was contrary to American policy to accept milk from herds which were not TB. free. Medical records, however, show no incidence of milk transmitted disease.

The Australian eggs were satisfactory but the shells were weak, adversely affecting the keeping qualities and increasing losses in transit from breakages.

The main difficulties the U.S.A. Veterinary Service encountered were the result of inadequate railway, road and sea transport facilities and also shortage of storage and refrigeration space.

During December, 1944, the peak period, of a total of 259,186,946 lb. of food of animal origin, and 61,053,337 lb. of other foods inspected on delivery by the U.S.A. Veterinary Service, only 1·35% (approx.) of those of animal origin and 1·74% of other foods were condemned.—J. A. G.

TODD, F. A. (1947.) **Veterinary preventive medicine in civil affairs and military government (G-5) in Northwest Europe from D-Day to V-Day.**—*Yale J. Biol. Med.* **19.** 563–569. **1697**

This report shows the great value of the work carried out by the special veterinary service set up for the Civil Affairs and Military Government of the Allied Forces in Europe and indicates the great saving brought about both in animals and the food supply by the suppression of epizootics which usually follow wars. The following duties were assigned to the Veterinary Service :– (1) To prevent the introduction of those rapidly spreading diseases such as rinderpest, bovine contagious pleuro-pneumonia and swine fever into Europe or if they had already entered to take vigorous measures to prevent their spread and to bring about their eradication. (2) To prevent the spread and to effect the control of the lesser diseases such

as anthrax, foot and mouth disease, swine erysipelas, glanders and parasitic mange of horse and sheep. (3) To establish regulations controlling these diseases and to safeguard the quality of the milk and meat supply.

It was realized that only with the help of the existing veterinary services of the liberated or occupied country could the plan be effective and their help was asked for and given to the maximum. The notifiable diseases in most countries are :- rinderpest, F. & M. disease, contagious pleuro-pneumonia, rabies, glanders, dourine, swine plague, Borna disease, brucellosis, infectious anaemia, swine fever, swine erysipelas, scabies, tuberculosis, equine influenza, blackleg, fowl pest, fowl typhoid and foul brood (bees).

The report details how an outbreak of swine fever was controlled in Normandy in the spring of 1945 and an outbreak of F. & M. disease which appeared on the German border during the autumn of 1944 amongst stock about to be evacuated into Holland, was successfully dealt with. The procedure was satisfactory in that no outbreak of F. & M. was reported to have spread from the restricted area.—D. S. Rabagliati.

REPRODUCTION AND REPRODUCTIVE DISORDERS

Holt, A. F. (1947.) **Some practical aspects of artificial insemination.**—*Vet. Rec.* **59.** 589–591. **1698**

A discussion of the general management of an artificial insemination centre.—J. D. R.

Halcrow, R. G. (1947.) **Improved flask for the transport of bovine semen.**—*Vet. Rec.* **59.** 597. **1699**

A method of arranging semen samples for transport in ice packed vacuum flasks is described with the aid of diagrams. H. suggests that low conception rates may be due to faulty packing and storage.—J. D. Rankin.

Hynek, B. (1947.) Jsou semenné váčky u kance reservoirem spermat ? **[Are the vesiculi seminales receptacles of the sperm?]**—*Čas. československ. Vet.* **2.** 12. **1700**

Immediately after castration a boar was mated with a sow on heat. The coition was performed with full sexual vigour and excitement. Conception followed and six pigs were born. H. concludes that the vesiculi seminales are of the nature of seminal reservoirs.—E. Přibyl.

Neumann, R. (1947.) O připouštěni klisen. **[The proper time of serving mares.]**—*Čas československ. Vet.* **2.** 26–28. **1701**

Since the life of the spermatozoa in the female genital tract is short, the mare should be mated just before the egg is shed, *i.e.*, on the third and the fifth days in each heat period.—E. P.

Letard, E. (1944.) Des variations du taux de fécundité des mâles chez les animaux de la ferme. Nécessité de leur contrôle. **[Variations in male fertility in farm animals. Need for control.]**—*C.R. Acad. Agric. Fr.* **30.** 136. **1702**

Some males show normal desire and will mate readily, producing apparently normal spermatozoa but are found to be sterile. Often they have had a year or two of successful service previously which makes them more difficult to detect. Complete sterility is harmful but partial sterility is even more so as partially sterile animals may go undetected for several seasons. It is uncommon in pigs, in which animal it would be shown by the small litters ; but in uniparous animals it is increasing as breeders tend to place other traits such as milk yield, meat yield, etc., above fecundity. In selecting sires breeders should attend to the fecundity records of the relatives, in order to eliminate this fault.—R. Macgregor.

Bravo, D. C. (1940.) Esterilidad del ganado asnal de Baleares. **[Sterility in donkeys in the Balearic Isles.]**—*Trab. Inst. Biol. anim., Madrid.* **5.** 217–231. **1703**

Temporary infertility in female donkeys is a very common occurrence in the Balearic Islands. The main cause seems to be lack of co-ordination between ovulation and copulation which is remedied by having the donkeys covered at least three times during the period of heat, with 24-hour intervals, and if oestrus be prolonged for a further one or two days, then the animal should be covered again. Another cause of infertility remedied by artificial insemination is malformation or displacement of the uterine cervix.—I. W. Jennings.

Mies, A., Jr. (1944.) Virus aftoso e esterilidade nos carneiros. **[Foot and mouth disease as a cause of sterility in rams.]**—*Bol. Soc. brasil. Med. vet.* **13.** 219–222. **1704**

The author confirms that an attack of F. & M. disease may be followed in rams by a temporary period of sterility indicated by azoospermia.—W. M. Henderson.

Gunn, J. A. (1944.) **The action of adrenaline and of choline esters on the uterus of the sheep.**—*J. Physiol.* **103.** 290–296. **1705**

Experiments on strips of exsected uteri of four non-pregnant and four pregnant (full term) sheep showed that adrenalin stimulated the contractions of the non-pregnant uterus but inhibited those of the pregnant uterus. This uterine

response to adrenalin differs from that hitherto described in any species of animal. The pregnant uterus responded to much lower concentrations of adrenalin than did the non-pregnant uterus, with a dilution as low as 1 in 2×10^9, thus showing that it is one of the most sensitive of all forms of smooth muscle to the action of adrenalin. The actions of ephedrine were qualitatively similar to those of adrenalin; tyramine and β-phenylethylamine caused feeble contractions of the uterus both in the pregnant and non-pregnant condition. Acetylcholine and carbachol (carbamylcholine chloride) stimulated contractions of both pregnant and non-pregnant uteri.

Observations on the exsected uterus of one pregnant (full term) goat showed that the response was qualitatively and quantitatively similar to that of the uterus of the pregnant sheep.—R. A.

McDonald, M. R., & Riddle, O. (1945.) **The effect of reproduction and estrogen administration on the partition of calcium, phosphorus, and nitrogen in pigeon plasma.**—*J. biol. Chem.* **159.** 445–464. **1706**

Studies were made of the changes in the partition of the various Ca, P and N components of the plasma of female pigeons during the reproductive cycle, and of mature and immature male and female pigeons, normal, fasted, parathyroidectomized and hypophysectomized and injected with various oestrogens.

No significant differences occurred in the ultrafiltrable Ca and inorganic P or in the non-protein nitrogen during the reproductive cycle or after the injection of oestrogens. Non-ultrafiltrable Ca and inorganic P, lipoid and protein P, all increased markedly from four days before the ovulation of the first egg until two days after the ovulation of the second (and last) egg. Even greater increases resulted from the administration of oestrogens in fasted, parathyroidectomized, hypophysectomized and normal pigeons, with small increases in the plasma protein N. There was evidence that non-ultrafiltrable inorganic P was probably a colloidal form of calcium phosphate.

The Ca-combining capacity of serum vitellin (a phosphoprotein) was eight or nine times greater than that of any other plasma protein. The increased non-ultrafiltrable Ca found during reproduction and after injection of oestrogens was accounted for by movements in both colloidal calcium phosphate and vitellin-bound Ca. These latter forms were partially adsorbed by barium sulphate, which however did not satisfactorily separate the various non-ultrafiltrable Cafractions.

The androgen, androstenedione, had no significant effect on any of the Ca, P and N components studied in the present investigations. —A. Eden.

Moore, G. R. (1946.) **The blood picture in cases of retained fetal membranes in cattle.**—*J. Amer. vet. med. Ass.* **109.** 39–45, **1707**

M. examined the blood of 100 cases of retained placenta as they were presented for treatment.

The only significant changes noted were a shift to the left in the neutrophiles and the appearance of toxic granulation in the neutrophiles, both these phenomena being most evident at 72 hours post partum, 76% toxic granulation being recorded at this period.

M. discusses his own and other authors' figures for the blood of normal parturient cattle and shows that toxic granulation is absent in these cases.

The results are interpreted in terms of death and degeneration of the placenta as related to the post partum thickening of the uterine wall and associated uterine involution.—J. A. J. Venn.

Ojemann, J. G. (1942.) De invloed van de lactatie op de bloedsamenstelling van den hond. **[The influence of lactation on the blood picture of the dog.]**—*Tijdschr. Diergeneesk.* **69.** 620–622. [English, French and German summaries.] **1708**

A marked basophilia was observed in a bitch with a mammary tumour accompanied by milk secretion from the unaffected mammary gland. The basophilia disappeared on the cessation of lactation. O. examined the blood of 20 bitches lactating during pseudo-pregnancy. In some there was a marked increase in eosinophiles and basophiles, an increase in lymphocytes, and a slight decrease in the polymorphonuclears while the monocytes were normal. Bitches in which lactation had followed a normal pregnancy were examined and in some there was a marked eosinophilia. Some of the bitches with pseudo-pregnancy were treated with hormones (menformon and stilboestrol) and re-examined after lactation had ceased. The blood picture was not influenced. Mercuric chloride precipitation tests on serum were also carried out on these groups. O. concludes that basophilia or eosinophilia and reaction to the mercuric chloride precipitation test may occur in bitches with normal or spurious lactation.—P. L. le Roux.

Fontaine, J. (1943.) Vorversuche zur Röntgenkastration des Hundes. **[Preliminary experiments in castrating dogs with X-rays.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 94–96. **1709**

Five male dogs were submitted to X-ray treatment, by one to two applications, of total

doses of 1,200–9,600 röntgen units. Early and late effects were studied histologically on extirpated testicles; photomicrographs are given.

The following cells were sensitive to X-rays and underwent atrophy in the order given:– spermatogonia, spermatocytes, spermatids, spermatozoa, Sertoli cells. Irreversible spermatogenesis was found to be caused by 3,600 r. and higher doses caused severe or even fatal irradiation "burns" of the whole irradiated region.—J. E.

See also abst. **1726** (annual report).

ZOOTECHNY

HERMAN, C. M. (1945.) **Deer management problems as related to diseases and parasites of domestic range livestock.**—*Trans. 10th N. Amer. Wildl. Conf., 1945.* pp. 242–246. **1710**

Many diseases of cattle affect deer, the young being most susceptible. The main losses are due to malnutrition and parasitic infestations. The grazing of cattle and sheep over or adjacent to range areas used by deer infects the pasture with intestinal and other helminths which cause losses either alone or associated with adverse nutritional conditions due to overstocking. The great difficulty with wild deer is the application of control measures used in dealing with helminth infesting livestock.

Control of disease in deer by reducing their numbers was applied in California in 1924 to control an outbreak of F. & M. disease; 22,000 deer were slaughtered. In Florida, also, in 1930 deer eradication was attempted to reduce the spread of the ticks which transmit bovine piroplasmosis. Necrobacillosis of sheep and of cattle are also transmissible to deer. Those diseases and the various helminth infestations of livestock have always caused greater losses, amounting in some cases to epizootics, when there were too many animals for the available food supply, whether these were domestic livestock or deer.

—J. A. GRIFFITHS.

STODDART, L. A., & RASMUSSEN, D. I. (1945.) **Deer management and range livestock production.**—*Circ. Utah Agric. Exp. Sta.* No. 121. pp. 17. **1711**

The mule deer is the major game animal in Utah, the state where most game occur in the U.S.A. In 1941 it was estimated there were about 223,000 deer, 5,300 elk, and 1,900 antelope. Problems of overstocking by both game and domestic livestock are increasing; while livestock have only to be fed on the range during part of the year, game must find sufficient to survive throughout the year.

Deer tend to remain in the area where they were born even though food may be so short that deaths result from starvation. When measures are taken to provide fodder for game, as during severe winter conditions, abnormal death rates result from larger numbers entering the area than the range can support throughout the year. Deer numbers are limited by the capacity of range to support the animals throughout the winter. Some tables included show remarkable differences in the weight of carcasses of deer from an average good range and one which is overstocked. The weight of the latter only amount to from 69% to 73% of the former.

The common plants eaten by deer are *Pachistima myrsinites* (mountain myrtle), *Ceanothus velutinus* (snow bush), *Berberis repens* (mountain holly), *Garrya flavescens* (silktassel), *Quercus wilcoxii* (live oak), *Arctostaphylos* (chaparral). This group is not readily eaten by livestock. Another group which is very abundant and of great importance for deer food are *Artemisia tridentata* (big sage bush), *Juniperus* (cedar), *Quercus gambelii* (scrub oak), *Cercocarpus ledifolius* (curl leaf mahogany), *Populus tremuloides* (aspen) and a number of weeds such as *Wyethia amplexicaulis* (dock). Some plants poisonous to livestock are readily eaten by deer, they include "death camas" (Liliaceae), "low larkspur" (Ranunculaceae), "chokecherry" (Rosaceae) and others. Many plants eaten by livestock in large quantity are not palatable to deer. This group includes all the grasses except when they are green in the spring, when small amounts are eaten by deer. Essentially mule deer are shrub or bush eaters and they do not thrive without this kind of native forage. Many plants eaten by deer during the summer are palatable also to livestock, particularly sheep and when there is over-stocking the competition may be severe.

When stocking conditions are satisfactory there is little competition between livestock and deer. A few browse plants are palatable to both, *i.e.*, *Purshia tridentata* (bitter brush), *Cercocarpus montanus* (mountain mahogany), *Amelanchier* spp. (service berry) and *Cowania stansburiana* (cliff rose).

Deer do occasionally eat growing crops intended for livestock, such as alfalfa, but they feed mainly in areas not used by or inaccessible to livestock, and on the whole their main diet is not that on which domestic livestock subsist. The necessity of keeping the numbers of both game and livestock within the capacity of the range is emphasized as a means of maintaining maximum meat production.—J. A. GRIFFITHS.

DODD, F. H., & FOOT, A. S. (1947.) **Experiments on milking technique. I. Effect of washing the udder with hot water. II. Effect of reducing milking time.**—*J. Dairy Res.* **15.** 1–17. **1712**

An experiment is described of washing the udders, of nine cows in declining lactation, with water at 115°F. During control fortnights before and after the experiment the washing of the animals was according to customary procedure, hosing with cold water, curry combing of hind quarters, washing the udder with a cloth dipped in cold water and drying of the udder with cloths. In the experimental period the teat cups of the milking machine were applied immediately after washing. The treatment appeared to arrest the rate of decline and the percentage of solids not fat (S.N.F.) and fat increased slightly.

In a further experiment using pairs of cows the effect of gradually decreasing the milking time was observed. There were control periods of two weeks before and after the experiment and during the last three weeks of the experimental period the udders were washed with warm water. Over a period of 11 weeks the milking time was decreased to 60% of the original. The yield and S.N.F. percentage remained constant, the fat percentage was slightly lower, the average rate of flow increased 14% and the maximum rate of flow was reached sooner.

Neither experiment had any serious effect on the incidence of mastitis.—A. G. WARREN.

HILL, J. L. (1946.) **Factors influencing the distribution of arsenic over the fleece of sheep after immersion in arsenical solutions.**—*J. Coun. sci. industr. Res. Aust.* **19.** 245–250. **1713**

See also abst. **1735** (heredity—a text-book).

Wool samples were collected from various parts of the body of sheep which had been dipped in arsenical dipping fluids and analysed to determine the distribution of arsenic in the fleece. The results were very variable but in general more arsenic was found in samples taken along the mid line of the back. This was thought to be due to drainage of dip off the sheep. The addition of wetting agents made no difference to the distribution of the arsenic.—N. P. H. GRAHAM.

HERMANSSON, K. A. (1945.) Moderniserad blodavtappning vid slakt. [**A modern method of bleeding slaughter animals.**]—*Skand. VetTidskr.* **35.** 293–303. [English summary.] **1714**

H. describes the use of a 10% solution of sodium pyrophosphate to prevent coagulation of sterile blood drawn off from animals at abattoirs before slaughter. 1½ litres of this solution prevents the coagulation of 30–35 litres of blood.

A special knife containing a tube is used for sticking the animal, the blood drawn through this tube (by vacuum pump with a pulsator from a milking machine) then passing into the solution. The resulting plasma is clear yellow and practically haemoglobin-free. The apparatus is illustrated.
—F. E. W.

NORDANG, J. (1947.) Fôringsproblem for rev og andre pelsdyr. [**Fodder problem for foxes and other pelt animals.**]—*Norsk VetTidsskr.* **59.** 205–208. **1715**

The finding at P.M. of a silver fox cub that the stomach has been perforated by a fish bone suggested the necessity for adequate grinding of the food for young foxes at the time of weaning.
—M. C.

TECHNIQUE AND APPARATUS

WEST, D. E., & BORMAN, E. K. (1945.) **The culturing of blood clots for brucella organisms.**—*J. infect. Dis.* **77.** 187–192. **1716**

The macerated blood clot was added to a crystal violet tryptose broth and incubated for 4–7 days under CO_2 tension at 35°C. A smokeless candle burning in the incubator provided approximately 2·3% CO_2 which was as effective as a measured 10% CO_2 content. One drop of broth culture was streaked on to crystal violet tryptose agar plates each week for three weeks, these plates being incubated for four days under CO_2 tension at 35°C., suspicious colonies being transferred to Kligler iron agar slants modified by the addition of 1% sucrose.

Huddleson (private communication) had warned the authors that crystal violet inhibited small numbers of *Brucella suis*; and that consequently an infection due to this organism might not be revealed by such a test.

Of the 42 cultures isolated by this method from 4,051 clots, seven were from individuals with negative agglutination reactions.—J. I. TAYLOR.

HARMSEN, G. W., & KOLFF, W. J. (1947.) **Cultivation of microorganisms with the aid of cellophane membranes.**—*Science.* **105.** 582–583. **1717**

The cultivation of bacteria on cellophane membranes through which the nutrient medium dialyses is described. Three adaptations of the apparatus are illustrated in diagram form.
—J. D. RANKIN.

FERRANDO, G., & FERRARI, A. (1945.) Sulla colorazione del micobatterio del tubercolo secondo il metodo di V. Hallberg. [**Staining**

Mycobacterium tuberculosis **by von Halberg's technique.**]—*G. Batt. Immun.* **33.** 37–48. [English, French & German summaries.] **1718**

In a comparison of von Halberg's technique with the Ziehl-Neelsen method, on 230 sputa samples from phthisical patients and of other samples (urine, seminal fluid, pleural exudate) the authors found that observation was easier by the von Halberg technique; the organisms take the stain well and appear on the whole to be larger and better defined.—K. J. SINCLAIR.

BAILLIF, R. N., & KIMBROUGH, C. (1947.) **Studies on leucocyte granules after staining with sudan black B and May-Grünwald Giemsa.**—*J. Lab. clin. Med.* **32.** 155–166. [Authors' summary copied *verbatim.*] **1719**

Dried films of normal and abnormal blood were stained with sudan black B and then treated with the May-Grünwald Giemsa dye combination. The first stain was found to blacken specifically the definitive neutrophile and eosinophile leucocyte granules and to leave all other cell parts unaffected. Architectural features of these cells, such as nuclear pattern, can be stained by a proved method (May-Grünwald Giemsa) and used as an aid in cell identification. Similarly, the hyaloplasm is also differentially colored so that it serves as an efficient contrast medium for the blackened granules.

After exposure to the sudan stain, neutrophile granules appear as small, spherical slate-gray bodies. They are typically collected into groups within the cytoplasm.

Eosinophile granules are larger in size than the preceding type and are spherical or spheroidal in form. They are composed of a peripheral, deeply sudanophilic shell and a central sudanophobic core. These two regions are sharply demarcated from each other.

Basophile granules are found to be sudanophobic in reaction, as are also azurophile elements.

The granular content of some immature pathologic leucocytes is discussed briefly, especially with reference to the aquisition of sudanophilia during maturation.

Several types of abnormal granules (from pathologic blood) are considered. It is noted that sudan black B is useful in differentiating certain specific (sudanophilic) from non-specific (sudanophobic) granules, especially when the two forms stain similarly with the usual hematologic dye mixtures.

STEEDMAN, H. F. (1947.) **Ester wax: A new embedding medium.**—*Quart. J. micr. Sci.* **88.** 123–133. [Author's summary slightly amended.] **1720**

Ester wax is a new ribboning embedding medium. It consists of five substances which may be varied in proportion so that media of different characteristics may be produced. A mixture which will meet most requirements is as follows: Diethylene glycol distearate 73 gm., Ethyl cellulose 4 gm., Stearic acid 5 gm., Castor oil 8 gm., Diethylene glycol monostearate 10 gm.

The wax has a melting-point of 46–8°C. and a section range of 2–20μ at a room temperature of 64°F. The ribbon range is 2–15μ at a room temperature of 64°F. and final compression loss is 7·6 per cent, at 10μ (after flattening). Alcohols, ethers, esters, ketones, hydrocarbons, aldehydes, chlorinated hydrocarbons, natural oils, &c., may be used as solvents.

Cutting must be done more slowly than with paraffin wax. Sections may be flattened on tap-water or aqueous staining solutions. Flattening must be completed in a drying oven at 40–50°C. with sufficient water under the sections to float them. Staining may be done in the ribbon, or as for paraffin wax sections. Xylene, benzene or ligroin, &c., are used as pre-mounting fluid followed by 'Sira', or Kirkpatrick and Lendrum's polystyrene mounting medium.

It is believed that ester wax may open up new methods in histology and cytology. Its greater water tolerance and its property of ribbon staining followed by drying constitute an advantage found in no other embedding medium. Greater use of the wide range of solvents as stain carriers is indicated.

CROSSMON, G., & GALLASCH, B. G. (1947.) **The counting of blood cells by dark-field illumination.**—*J. Lab. clin. med.* **32.** 206–209. [Authors' summary and conclusions slightly amended.] **1721**

A method has been described for the counting of blood cells in an all glass counting chamber. This technique, modified as may be necessary, can be used for counting certain other objects. In order to increase the focal length of the Abbe condenser, 1·25 N.A., the upper lens of the condenser must be removed; if a 43X, O·65 N.A. objective is used, a funnel stop is necessary to reduce its numerical aperture. Dependent on the location chosen, above or below the condenser, a 13 or 16 mm. stop or disc should be used with the 10X objective and a 16 or 20 mm. stop has proved satisfactory with the 43X objective. The size of the stop for either the 10X or 43X objective is not critical. It is possible that with counting chambers other than those used in this study better results may be obtained with stops slightly smaller or larger than those suggested. The brightness of the counting chamber ruling is dependent on the depth and width of the lines and also on the thickness of the counting chamber. For best results, the over-all thickness of the

chamber should be 5 mm. or less and the ruling should be relatively deep and heavy. In place of opaque stops Rheinberg color discs can be used. Blood cells thus are shown as white or red objects on a green background.

SILVER, S. D. (1946.) **Constant flow gassing chambers: principles influencing design and operation.** —*J. Lab. clin. Med.* **31.** 1153–1161. **1722**

S. discusses the physics of the flow through a chamber of air into which an active agent under investigation is introduced, and elaborates principles which influence the design and operation of constant flow chambers for experimentally exposing animals or human subjects to the action of gaseous or particular agents. The principles have been experimentally verified by comparing actual and theoretical concentrations of active agents with varying conditions. These may be summarized as follows :– (a) *the air flow* through the chamber influences the time for equilibration of 99 % of the theoretically constant concentration, the concentration which can be established for any given agent, and the speed at which animals may be inserted into the chamber ; (b) *the size of the chamber* influences the time for equilibration, the loss in concentration due to surface effects and the number of experimental subjects which can be exposed at one time ; (c) *the character and quantity* of the interior surface of the chamber influences the loss in concentration due to surface effects ; (d) *the shape of the chamber* influences the surface volume relationship and hence the loss in concentration due to surface effects ; (e) *the relative areas of air inlet and door opening* influences the maximum rate of disposal of the active agent ; (f) *the number and size of the animals* influence the rate of insertion of animals into the chamber and the loss of concentration due to surface effects.

Data are given for these factors.—A. EDEN.

SCOTT, C. C., & WORTH, H. M. (1947.) **An apparatus for continuous recording of the volume of expired air.**—*J. Lab. clin. Med.* **32.** 1496–1499. [Authors' summary copied *verbatim.*] **1723**

An apparatus is described which continuously records the volume of expired air. Essentially it consists of two spirometers with appropriate valves. While one spirometer fills with expired air, the other tank empties. At each filling, registration is made by both a signal magnet and an automatic counter.

MACALLISTER, D. I. (1947.) **Apparatus for rapid udder infusion.**—*Vet. Rec.* **59.** 586. **1724**

A 10 ml. record syringe is clipped to the top of a 250 ml. " vena flask " to which it is connected by a three-way tap, which can be set for filling and emptying the syringe, and for discharging into the teat siphon. [No information is given regarding the safety of this apparatus with regard to the possibility that tuberculosis or other infection might be transmitted accidentally from cow to cow.]—J. I. T.

POPHAM, W. L. (1947.) **Blowers for insecticides** —*Yearb. U.S. Dep. Agric., 1943–1947.* pp. 839–842. **1725**

Recent developments in the U.S.A. of powerful blowers for the distribution of insecticide concentrate, either as atomized liquids or dusts are outlined. In one apparatus, high velocity air was used to project finely atomized liquid concentrate in an even pattern for at least 100 feet from the nozzle and so could project insecticide to the top of the largest trees. Blowers make practicable the even distribution of insecticides such as D.D.T., in concentrated atomized liquid form, at rates of as little as 1–3 gallons of liquid per acre, including a proportion of emulsifier and adhesive.—L. DAVIES.

REPORTS

AUSTRALIA. (1946.) **Twentieth annual report of the Council for Scientific and Industrial Research, for the year ended 30th June 1946.** Items of veterinary interest pp. 18–20, 24–35. pp. 127. Canberra: L. F. Johnston, Govt. Printer. [5s. 4d.] **1726**

The main factors permitting absorption of ε toxin of *Cl. welchii* type D from the bowel were a very high concentration of toxin, its presence at a high level of the small bowel and some means of localizing the toxin for a period. The pathogenicity of *Cl. chauvoei* for g. pigs was strikingly enhanced by admixture with adrenalin. Figures are given to indicate the importance of shearing wounds of sheep as portals of entry of *Corynebact. ovis.* Vaccination, repeated yearly for several years, increased resistance to infection but did not prevent development of lesions.

Further work on complement fixation tests for TUBERCULOSIS of cattle is reported, with figures for results in animals which failed to respond to tuberculin tests. Ingestion of *Str. agalactiae* during calfhood did not appear to be followed by MASTITIS at first lactation. The most effective use of penicillin was attained by three doses of 25,000 units at intervals of 24 hours.

The limiting effect of molybdenum on copper storage in sheep was confirmed, but the evidence available does not suggest that deficiency of

molybdenum is associated with TOXAEMIC JAUNDICE in the field.

Systematic observations on HAEMATURIA VESICALIS of cattle will follow the development of methods for estimating urinary phenolic compounds.

Reduction in milk yield occasioned by vaccination of adult lactating cows with "strain 19" was minimized if the plane of nutrition was high.

The histidine-decarboxylating organism referred to in the previous report on wheat has been isolated. It is a lactobacillus. Attempts are being made to assess the role of alimentary histamine in causing laminitis of horses following wheat engorgement, by using anti-histamine drugs.

Anaplasma centrale and *Bartonella bovis* may be separated by a differential effect of low temperature. *A. centrale* withstood 16 months at −80°C., but *Bartonella bovis* was no longer viable.

The following compounds showed no anthelmintic effects against *Haemonchus contortus* when injected into the rumen:– Dinaphthyl-thiourea, chloranil, ethyl cresolinate, naphthyl-thiourea, hexachlorocyclohexane ("666"), benzyl chloride, alpha-terpineol, trichlorbenzene, tetrachlorbenzene, para-tertiary butyl phenol ("butylphen") and hexane. When injected into the abomasum dinaphthyl-thiourea and chloranil were ineffective, but anthelmintic effects were shown by thiocarbanilide, 2,3-dichloro-naphthyl-quinone, para-tertiary butyl phenol and hexane.

Calcium fluoride in relatively large doses injected into rumen or abomasum had erratic and temporary effects in depressing egg production. Nicotine bentonite, at non-toxic levels, was ineffective when injected into the rumen. Copper sulphate was moderately to highly effective against *H. contortus* when 2 g. or 3 g. doses were injected into the rumen, but a 1 g. dose was ineffective.

When injected into the rumen *p*-tertiary butyl phenol was ineffective against *Trichostrongylus* spp., but when injected into the abomasum it was moderately effective. Phenothiazine, even in relatively small doses, was no less effective *via* the rumen than *via* the abomasum. The efficiency of phenothiazine in doses from 10–50 g. was tested against *Trichostrongylus* spp. in 80 sheep. The curve plotted through points representing dose rate/anthelmintic efficiency suggested progressive increase in efficiency up to the largest dose used.

Micronized and commercial phenothiazine powder were compared for efficiency against *Oesophagostomum columbianum* in 54 sheep. At dose levels of 10, 15 and 20 g. the micronized form of the powder appeared to be slightly, but not significantly, more effective than the commercial product.

In field trials with phenothiazine in salt lick it was found that sheep seldom consumed sufficient to give anthelmintic effects and there were merely intermittent effects on development of larvae in faecal cultures. Phenothiazine intakes did not exceed 0·25 g. per sheep per day, and on only a few occasions was this level attained. There was a good deal of staining of the wool of sheep provided with phenothiazine-salt mixtures.

Repeated doses of phenothiazine of 0·25 g. per day prevented development of larvae in faecal cultures. Continued daily dosing with 0·5–1·0 g. eliminated *H. contortus* but had no marked effect on *Trichostrongylus* spp. These doses had no effect on development of larvae of *Strongyloides* in cultures.

The appetite of sheep dosed with larvae of *O. columbianum* decreased by 50% within three weeks, with a 20–30% loss of body weight which was not regained for 7–11 months, although the sheep were kept in pens on good rations.

Epidemiological studies have been continued. It was found that sheep heavily infested with *H. contortus* could be further infested, and that sheep which had thrown off an initial infestation, or from which this parasite had been eliminated by phenothiazine, could be reinfested within a few days.

In field studies on the effects of nutrition on parasitism, interesting results were obtained. Sheep grazed on a growing oat crop made striking gains in body weight and quickly threw off infestations with *O. columbianum*. At the same time infestations with *H. contortus* and *Trichostrongylus* spp. increased.

Studies on parasite physiology have begun with studies on the metabolism of *Trichostrongylus* spp. and on the detoxicating mechanisms in the gut of normal and nematode infested sheep.

Studies on the distribution of arsenic in sheep after dipping revealed appreciable quantities in the rumen though none was swallowed. Excretion of arsenic *via* the saliva is thought to be responsible, for it was found that eight hours after dipping the arsenic content of saliva was 30 times that of the blood.

Emulsions of D.D.T. showed decreasing concentrations as the number of sheep dipped increased, and there was a corresponding decrease in insecticidal effect against the sheep ked.

Hexachlorcyclohexane ("666") in dilutions of 1 : 3,000 to 1 : 6,000 killed adult keds but a decrease in concentration as more sheep were dipped resulted in an insufficient residual effect to destroy young keds which subsequently emerged from pupae. A dilution of 1 : 2,000 was effective against *Bovicola ovis*.

Rotenone at a concentration of 1 : 40,000 was

effective against adult keds but there was no useful residual effect on young keds emerging from pupae. Effects on *B. ovis* were very slight.

The life-cycle of *B. ovis* on the sheep closely approximates that found *in vitro* at 36·5°C. and 50–70% relative humidity.

Studies on SHEEP BLOWFLY include effects of modified Mules operation and optimal tail length on the incidence of fly strike, and surgical removal of skin from the tail to reduce strike on the tail. Dressings containing boric acid, citronella and bentonite proved useful for lamb-marking wounds. Studies on body strike have begun. D.D.T. in insectary studies provided 4–6 weeks' protection against fly strike when applied to the fleece. Preliminary studies with hexachlorcyclohexane (" 666 ") suggested shorter periods of protection.

D.D.T. is more effective as a stomach poison to maggots than sodium arsenite or boric acid, and is more toxic to young maggots than to the older larvae.

Modifications of the standard dipping solution for cattle tick (8 lb. arsenic per 100 gallons) were made by additions of D.D.T., rotenone or nicotine sulphate, or by altering *p*H from somewhat alkaline to strongly acid without material improvement under field conditions.

Trials with 2% D.D.T. emulsions cleared cattle of ticks and protected against reinfestation for about 12 days. D.D.T. in dipping vats has remained active for three months, during which 5,000 cattle were dipped. Long term toxicity trials with D.D.T. were begun.

In dairy herds the buffalo fly may be controlled effectively by any one of three methods :– D.D.T.-treated, glass walled traps ; lightly spraying cattle with 4% D.D.T. in power kerosene every second or third day ; or more heavy spraying of the shoulders of about half the cattle with 2–4 fl. oz. of a 2% D.D.T. emulsion or 0·5% D.D.T. as " rucide ".

Dipping in 0·5% D.D.T. as " rucide " for control of cattle tick gave complete protection against buffalo fly, the protective period being longer than the life-cycle.

Insect control of St. John's Wort (*Hypericum perforatum*) by means of *Chrysomela* spp. is showing considerable promise.

The amino acid constitution of wool keratin is being studied further. Studies on the amino acids of plant proteins have shown that the proteins in the leaves are of very similar composition from plant to plant. Thus the assemblage of amino acids by grazing sheep is of such regular composition as to simplify the understanding of the relationship between protein intake and wool production. Genetical propensity and nutritional history determine the efficiency of the individual sheep.

Metabolic studies include the processes of rumination with special reference to utilization of urea, cellulose digestion, absorption from the rumen and intermediary metabolism of fatty acids. Vitamin A requirements of sheep are relatively much lower than those of cattle. Studies on physiological and tissue metabolism showed that sub-lethal doses of cyanide administered over long periods brought about changes in the nervous system which are similar to those encountered in lambs born of copper-deficient ewes. Techniques have been devised for administration of large amounts of metabolites intravenously and for the establishment of permanent rumen fistulae.

Experiments on chronic FLUOROSIS are being continued. Sheep, six months old when the trial began, have had water supplies containing 0, 2·5, 5, 10 and 20 parts per million of fluorine and have not shown lesions of fluorosis during the first year of the trial.

Field and laboratory studies on COPPER and COBALT DEFICIENCIES have been continued. Under natural conditions these deficiencies vary in degree from acute forms which are fatal to incipient forms which are not readily detected, but which materially affect the health and productivity of sheep.

Absence of crimp, *per se*, does not explain the abnormal manufacturing performance of straight steely wools from sheep on copper-deficient diets. There are profound physico-chemical changes in the wool fibres.

Wool grown by sheep on a diet deficient in copper showed 10% less sulphur, due entirely to a lessened cystine content, methionine being unchanged. The acid-combining capacity of the deficient wool was changed. Affected wool fibres stretch more easily and recover less readily than normal fibres. In copper-deficient sheep the closure of the thiol group to the disulphide group of normal keratin is very much delayed, probably owing to lack of copper-containing enzymes which catalyse this reaction.

Field trials have shown that the copper requirements for normal health of the sheep are met by an intake of the element which is far below the level essential for the complete and normal keratinization of the wool.

Top dressing pastures with copper compounds provided sufficient intake by sheep to maintain good general health and ensure normal reproduction but may not provide for normal wool growth. Top dressing with cobalt compounds has proved an effective method for supplying this element.

Cobalt appears to be essential for the nutrition

of rumenal organisms. The onset of the anaemia associated with cobalt deficiency is not prevented by massive doses of liver or by depot therapy with iron and liver, nor do massive doses of zinc or of iron, or of nickel, alone or in combination, exert any beneficial effect.

Analyses of feedstuffs, water, and teeth of sheep on low calcium, high phosphorus rations, which have shown dental abnormalities resembling those seen in fluorosis, have shown that fluorine is not responsible. There are distinct differences to be observed by microscopical studies.

Phytates are almost completely broken down in the rumen of sheep.

Other nutritional studies dealt with drought feeding, ram feeding and oxalate-containing plants (blood from sheep affected with oxalate poisoning may contain sufficient oxalic acid to precipitate the serum calcium, thereby giving rise to misleading results from serum calcium estimations).

Work in progress includes progeny testing, specifications of sheep types for wool production, sampling of the fleece, and histological studies of the sheep's skin. Comparisons are being made between the responses of Camden Park type Merino and Corriedale sheep maintained on different levels of nutrition.

There was no evidence that pregnancy toxaemia in ewes may be caused by excessive production of oestrogens or toxic phenolic compounds derived from them. Pregnant ewes excrete oestrogens principally in the bile. The end product of progesterone metabolism in the ewe does not appear to be pregnandiol. Relatively high titres of gonadotropins have been found in the urine of wethers. Examination of diastatic activity of sheep's blood showed a diastatic cycle corresponding to the oestrus cycle. Investigations on the relation between chemical structure of compounds related to synthetic oestrogens and their influence on mammary developments are continuing.

Observations on the inheritance of skin wrinkles in sheep suggest that "wrinkling" and "plain-body" are paired characters, the inheritance of which is mendelian and multi-factor. Plain-body is dominant to wrinkling, and some observations suggest something akin to the "building up of dominance". Studies on the inheritance of horns in sheep indicate that accumulation of completely polled characterization is associated with the conception of "building up of dominance". Other studies with sheep concern the development of inbred flocks of Merinos, inheritance of "hollow-back", inheritance of hairiness or fluffytip and parrot mouth.

Zebu cattle are being crossed with milking breeds (Jersey, Red Poll, etc.) in order to develop a dairy breed for tropical conditions.

Other studies include observations on sheep classing, wool production by rams and wethers, surveys of wool production and beef production in Australia, pasture investigations relating to sheep infertility problems (subterranean clover pastures, particularly in Western Australia), grazing management trials in western Queensland, drug plants, dairy products research and biometrical work.

There are the usual lists of staff and publications, details of finance, composition of research committees, etc.—H. McL. Gordon.

—. (1947.) **Report of the FAO Mission for Greece.** pp. xi + 188. Washington: Food & Agriculture Organization of the United Nations. [Items of veterinary interest pp. 32, 33 & 34, 100–120.] **1727**

This report shows the deplorably primitive state of the Greek livestock industry due to the general poverty of the people and to the devastation of war. It is recommended that special recognition should be given to the selection and breeding of cattle and buffaloes in order to combine good draft quality in the male with reasonable milking capacity in the female; to developing a breed of specialized dairy cows for milk production in urban areas; to developing breeds of sheep with high milking capacity and a heavier and better quality fleece; and to breeding up native poultry to improved egg laying capacity combined with improved meat production. In general, selective breeding of the best indigenous stock, rather than the introduction of foreign sires, should be used as a common means of improvement, and for this purpose preliminary studies should be concerned with the determination of the potentialities of the native breeds under optimum conditions of feeding and management.

It was estimated that the annual monetary loss due to animal disease in Greece represents nearly 10% of the total capital value of the country's livestock. Greece possesses no veterinary school, no designated centre for research into veterinary medicine—the only opportunities for research are those which can be sandwiched into the routine diagnostic work of the large-scale serum production of the existing veterinary Microbiological Institute at Athens.

There was a serious lack of factual evidence in practically every branch of agriculture. It is realized that the improved stock must be adapted to the agricultural and social needs of the country; it must possess the maximum resistance or tolerance to local diseases, and if imported must not be carriers of introduced infection. Artificial insemination is discussed.

Of the 500,000 or 600,000 metric tons of milk produced in Greece, 45% is derived from sheep, 30% from goats, 20% from cows and less than 5% from buffaloes. Sheep and goats

together supply 75% of the country's meat supply, cattle contribute 15% and pigs make up the remaining 10%.

The state of the abattoirs and methods of slaughter and handling of meat are primitive in the extreme and the facilities for adequate inspection very poor.—D. S. RABAGLIATI.

COLONY OF MAURITIUS. (1945.) **Annual report of the Department of Agriculture, 1945.** [BODKIN, G. E.] pp. 34. Port Louis: Eliel Felix, Acting Govt. Printer. 8vo. 50 cents. **1728**

The importation of cattle for food from Madagascar amounted to 6,270 head and from Rodiguez to 172. The total cattle on the estates at the beginning of 1945 was 9,112 against 10,123 in 1944. 5,735 animals were submitted to a clinical examination for TRYPANOSOMIASIS in 1,583 centres. These were chiefly herd, milk and draft cattle. Only one positive case was found, this was a draft bullock and it was treated with naganol. The infective agent was *T. evansi.*

Out of 192 cattle tested with tuberculin 37 proved to be positive and most of these were sent to the abattoirs for slaughter.

Two herds were dispersed during the year and it was felt that the interest shown in breeding was waning, probably due to the high cost of transport which made the sale of manure difficult.

Research was carried on at the Palmar Breeding Centre and on artificial insemination. Eighty per cent. of the cows artificially inseminated proved to be in calf.

Of the female cattle examined during the year, 1,975 were allowed to be slaughtered on account of old age, injury or unproductivity.

Lectures to agricultural students were given on anatomy and physiology of farm animals, veterinary pathology and animal husbandry by the veterinary officer or his assistant.

—D. S. RABAGLIATI.

MCINTYRE, C. W., & RAGSDALE, A. C. (1945.) **The Hatch Dairy Experiment Station Farm.** [**A report** 1930-44.]—*Bull. Miss. agric. Exp. Sta.* No. 488. pp. 31. **1729**

Nine per cent. calf mortality caused by CALF PNEUMONIA was eliminated by improved housing methods. Calves are kept in individual pens until six weeks to two months of age. These pens have floors made on a foundation of 18 inches of cinders with five-inch unglazed hollow tiles covered with two inches of cement plaster. Each pen has a floor drain and in winter is provided with removable slatted wooden floors which are used from October to May. Older calves run in larger pens with concrete floors.

Details are given of the results of diathermy treatment of MASTITIS. Short-wave diathermy has been used since 1939 as an aid in control. A low-powered diatherm was first used for one hour daily on infected animals. A more powerful diatherm with half hour treatments has since been introduced. Recovered animals averaged 28 treatments and an average of 69 treatments was given to animals that remained positive. 90% of the recent infections and 44% of the old infections were arrested by the use of diathermy treatments.—J. A. GRIFFITHS.

SOBEK, V. (1947.) Zpráva o činnosti veterinární nemocnice v Havlíčkově Brodě. [**Report on the work of the veterinary hospital in Havlíčkuv Brod.**]—*Čas. československ. Vet.* **2.** 166–168. **1730**

Between November 1945 and the end of 1946, a total of 828 horses were treated, 25 surgical cases, 752 cases of skin diseases, mostly scabies, six cases of strangles, a single case of tetanus and 46 horses were in quarantine. Horses with sarcoptic mange were treated with sulphur dioxide for one hour in a gas chamber.

—E. PŘIBYL.

BOOK REVIEWS

POLONOVSKI, M. [Membre de l'Académie de Médecine], BOULANGER, P., MACHEBOEUF, M., ROCHE, J., & SANNIE, C. [Professeurs de Chimie biologique des Facultés de Médecine]. (1947.) Biochimie médicale. [**Medical biochemistry.**] pp. 709. Numerous figs., 9 tables. 3rd Revised Edit. Paris: Masson et Cie. **1731**

This is a book written for medical men, covering most adequately a wide field of biochemistry and it is obvious that much careful thought has gone into its compilation. There are six main divisions dealing with the constituents of living matter, chemical phenomena of digestion, the constitution of tissues and tissue fluids, intermediate metabolism, excretion and food. Broadly speaking, the book is well up to date and gives, for example, a short, though clear, account of the use of isotopes in biological investigations, and includes discussions of penicillin, streptomycin and folic acid. Biochemistry is a subject which has advanced very rapidly and it is easy enough to criticize sections which appear inadequate; *e.g.*, the very cursory discussion of anti-thyroid substances, or omissions, of the recent work on the metabolism of spermatozoa, or of the synthesis of doisynolic acid compounds. There is also a tendency to attribute important work and discoveries to French investigators. For example,

the section on the discovery of sulphonamides gives the impression that most of the work was done by French investigators and the same applies to the discussion on substrate competition.

The book is very well conceived and carefully written and should be a valuable source of information to those doing almost any kind of medical and veterinary research involving knowledge of biochemistry.—J. M. ROBSON.

SHERMAN, H. C. [Mitchill Professor of Chemistry, Columbia University]. (1943.) **The science of nutrition.** pp. x + 253. 11 tables. New York: Columbia University Press. [8vo. 15s.] **1732**

This book, comprising 15 chapters, presents the essential facts of nutrition so as to be clearly intelligible to the reader without specific science training. For others more deeply interested there is an extensive bibliography. Each chapter is an independent essay on a particular aspect of the subject, but there is a connecting theme running throughout.

Written in 1943, the author provides a wealth of information and the book should be of interest to all types of readers. The subject matter deals, however, with human nutrition and is not concerned with veterinary nutrition.—A. EDEN.

—. (1946.) **Memoranda on medical diseases in tropical and sub-tropical areas.** pp. 396. London: His Majesty's Stationery Office. 7s. 6d. 8th ed. **1733**

It is explained in the preface that this book does not claim to be more than a series of miscellaneous memoranda arranged in alphabetical order, the aim being to give medical officers something which offers in a concise form the essentials of the more important diseases of the tropics. It appears to fulfil this intention admirably, and might be of considerable value to veterinary surgeons working in semi-civilized tropical areas, and where information they may be able to collect might be of great value to the medical authorities. It gives a concise account of the aetiology, symptoms, methods of diagnosis, treatment and prophylaxis, of the principal tropical diseases, though one notices the absence of any mention of glanders which should still be important in units operating overseas.

The importance of dogs as hosts of leptospiral and leishmanial infections seems to be also somewhat underestimated, and though it is mentioned that there is no authentic record of infestation of man by *Cysticercus bovis*, no mention is made of the measures which should be adopted to prevent infestation with *Taenia saginata*.

In addition to descriptions of the human diseases, notes are given on arthropod pests and insects, including mosquitoes, sandflies, midges, house flies, tsetse flies, carcass flies and *Hippobosca*. A section is also given on the preparation and use of D.D.T. as sprays, emulsions, solutions and dusts, and its value in respect of various insects. It is said to be "effective against some species of ticks, but its value as a practical measure of control remains to be decided".

Useful notes are also given on zoological nomenclature, and a final note is given on paludrine, the action of which in malaria only became available after the book was in press. This drug apparently acts on the asexual parasites, inhibiting nuclear division, and it also prevents oocyst formation in the mosquito. Given in the prepatant period of infection it prevents the development of subtertian malaria, but only acts as a suppressive in the benign tertian form.—U. F. R.

PARISH, H. J. [M.D., F.R.C.P.E., D.P.H., Clinical Research Director, Wellcome Foundation Ltd.; formerly Bacteriologist, Wellcome Physiological Research Laboratories.] (1948.) **Bacterial and virus diseases. Antisera, toxoids, vaccines and tuberculins in prophylaxis and treatment.** pp. 168. Edinburgh: E. & S. Livingstone Ltd. 7s. 6d. **1734**

As stated in the preface the object of this little book is to present the essential principles of immunology and their practical application. In this it succeeds admirably and practitioners and students will find it very helpful. The diseases dealt with are in the main human but distemper, rabies and bovine tuberculosis are included. Interesting features are an historical summary giving the main important dates in the modern development of immunology and a carefully selected list of books for further reading.—M. C.

SHULL, A. F. [Professor of Zoology in the University of Michigan]. (1948.) **Heredity.** pp. ix + 311. New York & London: McGraw-Hill Publishing Co., Ltd. 4th Edit. 24s. **1735**

This textbook is designed for the use of students interested especially in human genetics. Examples used to illustrate phenomena have been selected for that purpose, this detracts from its value in so far as the veterinarian is concerned. There are 26 chapters, the first 18 deal with the general principles and are of value to all students whether of human, animal or plant heredity. The remaining eight chapters are of more strictly human interest. A short list of instructional films with details of the sources from which they may be obtained will be useful to teachers.—M. C.

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